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ON IRRITATION AND INSANITY.

A WORK,

WHEREIN THE RELATIONS OF THE PHYSICAL WITH THE MORAL CONDITIONS OF MAN, ARE ESTABLISHED ON THE BASIS OF PHYSIOLOGICAL MEDICINE.

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TRANSLATED

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TO WHICH ARE ADDED

TWO TRACTS ON MATERIALISM,

AND

AN OUTLINE OF THE ASSOCIATION OF IDEAS.

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PREFACE

OF THE TRANSLATOR.

THE features of what has been termed *Physiological Medicine* in France, and of which Dr. Broussais, Professor of Medicine, at the Hospital of Val de Grace, is the chief propounder and supporter, are principally these.

The Body consists of certain organized parts, as the circulating and respiratory apparatus, the thoracic and abdominal viscera, the muscular apparatus, the secreting and excreting glands, the osseous structure, &c.

The membranous elements of which these are composed, are tissues.—They are all of them subservient to the nervous apparatus, of which the Encephalon is the centre of communication.

The tissues of the animal body, appear to be composed chemically, of fibrine, of gelatin, and of albumen. The muscular parts are chiefly fibrine; the skin, the mucous membrane, &c. are chiefly gelatin; the nervous apparatus is albuminous. The phosphat and carbonat of lime composing the bones, do not seem to have like properties with the other tissues; but these chemical substances in the living body have not been fully examined. All of them, except the bones perhaps, are contractile upon the application of certain substances called *stimuli*: upon this property (of contractility) depends the motion and action of the organized parts.

Life is the aggregate of those functions which the several organic parts of the body perform, on being stimulated into action, by the natural stimuli of caloric, light, air, atmospheric electricity, and food, in the usual and regular proportions and degree.

The organic actions excited by these natural stimuli in a healthy body, constitute the normal, regular, healthy functions of the

various parts so stimulated into action ; the aggregate whereof, is included in the term *Life*. When the tissues from any cause, are more than usually irritable ; or the stimuli applied, are in excess as to proportion, or from their unusual character, the natural stimulation of the tissues and organs, becomes increased or exalted into over-excitement or over-stimulation, technically called *Irritation*. *Stimulation*, therefore, is the term appropriated to what produces regular, usual, normal, healthy action ; *Irritation*, to a morbid increase of stimulation ; and, in the language of *Rush*, may be termed, morbid action. *Irritation* has various shades and degrees, extending from a very slight excess of stimulation, up to inflammation, and consequent disorganization of the part affected, terminating in suppuration or in gangrene.

Irritation, producing abnormal, morbid action, may, according to the degree and continuance of the irritation, exist in a tissue or an organ, or a viscus, for a long time : the consequence will be functional derangement, without manifest organic lesion or destruction. After long continuance, this functional derangement may assume the character of habit, or may proceed gradually to sub-inflammation, inflammation, and disorganization.

Contractility, stimulation, irritation, are not entities distinct from the tissue itself, which is contractile and irritable, or which is stimulated or irritated : they are words without meaning, if the meaning do not strictly include the tissue stimulated or irritated : we know nothing of them, but in connection with the tissue itself, of which they are properties.

All the tissues are pervaded, more or less, by nervous fibre.

The nervous apparatus, consisting of the encephalon and its ramifications, and the spinal cord and its ramifications, may be considered as divided into two great portions—the one serving for voluntary, and the other for instinctive and automatic functions. The encephalic apparatus serves for the first, the spinal cord and its ramifications for the second set of functions.

Sensation, perception, feeling, consciousness, are words denoting that property or function of the encephalic nervous apparatus by which we have cognizance of objects extraneous to us, and also of the visceral affections and wants within us, transmitted to the encephalic centre by the internal visceral nerves. This property

or function of the encephalon is termed *Sensibility*. It connects us with the material world extraneous to our bodies, and with the affections or modifications of our internal organs, destined to instinctive and automatic functions.

Hence we have two sources of sensation, viz. one, the impressions made on the nerves of our senses by external objects; and another, the impressions made on our internal, visceral nerves, and thence transmitted to the nervous centre, the encephalon. The nervous apparatus of voluntarity, is stimulated to action by these transmissions of impressions from without, and affections from within us. The influence of the encephalic centre on the nervous system in various parts of the body, is called *Innervation*. The nerves that transmit to the brain information of the internal visceral affections, are not the same as those that transmit from the brain, the resulting voluntary motions.

All the tissues and organs of the body being instruments of, and subservient to the nervous apparatus of the encephalon, whenever any of these are morbidly irritated, or have suffered lesion, or any other abnormal (morbid) affection, the nerves of the part become irritated, and act sooner or later upon the encephalic, as well as on the neighboring nervous apparatus; the nervous system thus becomes gradually irritated, and assumes abnormal, morbid action, and what is called *disease* ensues.

Disease is a word only, not an entity or thing. Like other abstractions, it has been personified. But disease is strictly nothing else than the disordered action of some injured or irritated tissue, producing derangement of function; it has no meaning separate from the tissue actually affected: and the cure of disease, is the restoring the regular, healthy, normal action of the part, in lieu of the irregular, abnormal, morbid action which constitutes disease.*

Hence, no man is competent to pronounce on disease, who is not well acquainted with the regular, normal, healthy action of

* The leading principles of physiological therapeutics, are :—

Sedatives : including general, and topical bleeding by leeches and cupping : mucilaginous drinks : cold affusions : gentle laxatives and enemata. The general rule being, to avoid as much as possible, irritating by medicaments an internal surface already in a state of irritation.

Revulsives : as epispastics, sinapisms, and sinapial pediluvia, irritating unguents, cauterics, and issues.

the part morbidly affected ; so that from the symptoms and indications he can judge of the locality, the kind, and degree of abnormal action. All medicine is therefore founded on an accurate knowledge of anatomy and physiology, and on these alone. All else is empirical.

In the ensuing treatise, Dr. Broussais develops the elements of the physiological doctrines of stimulation, irritation, inflammation, and innervation. This is comprised in chapters 1, 3, 4.

He gives a history of medical theories, until the establishment of the Physiological Doctrine of Irritation in France, chap. 2.

He then proceeds to examine the ontological and psychological notions, which clerical metaphysics have introduced into physiology : and he shews, that we have no right to assume the existence of any hypothetical entity to account for those intellectual phenomena, which so far as our senses are to be trusted, are no other than the natural, normal functions of the encephalon. That we have no right to assume or to believe any thing which our senses external or internal—the only sources and inlets of knowledge that we possess—are unable to furnish us with the proof of, that we know, and can know nothing that our senses are incompetent to shew us, for we have no other means of information and of knowledge, than our external and internal senses : that all terms used in medicine, and all words and expressions of abstraction, are words only, and not things or actual phenomena : that there is no such entity as disease, either general, or particular, distinct and separate from the tissue actually affected : that there is no remedy other than the alteration actually produced in the affected tissue by the modifier employed for the purpose : that whether any man living can or cannot explain satisfactorily the rationale of organic functions intellectual or instinctive, is of no consequence to the matter of fact, which remains true whether we or any one else can explain it or not : that the phenomena termed intellectual, are

Counter Stimulants : as bark, arsenic, and copper in the apyrexia of periodical irritations ; such as intermittent and remittent fevers, and neuralgias. The Southern climate of the United States, seems to require more bold and decisive practice, than the Northern climate of Paris or London : hence, to us, the therapeutics of Broussais, Begin, Coster, &c. appear feeble ; but the *principles*, founded on the physiology and pathology of the tissues, are undeniable and universally applicable.

quite as difficult of explanation by the aid and intervention of a separate soul, as without it: and he deems it sufficient to shew that these phenomena are really, and in fact, the regular normal properties and functions of the encephalon, without pretending to explain how and why, and in what manner these properties and functions belong to that organ and are developed in it: an explanation to which he readily confesses himself as unequal, as his opponents are: that the whole difference between them is, that the phenomena—the facts, being the same, he acknowledges his inability to explain them,* while his opponents introduce an assumed, hypothetical entity, (the human soul) that explains nothing, and burthens the system with an additional and needless difficulty. All this occupies chapter 5; and the supplement also in reply to the metaphysical notions of M. Cousin.

In chapter six and seven, he developes the connection between the nervous system of the human body, and the phenomena of intellect and of instinct.

He then applies the physiological doctrine of irritation to the disorder called *INSANITY* under its various modifications; this occupies the whole of the second part of the work. Insanity had long been deemed a mental affection, or disorder of the soul; it became his business therefore to discard this gratuitously assumed entity, and to shew that insanity was an affection of the encephalon, and of that alone.

In the latter part of chap. 6 of the second part of the work, and in part of chap. 7, (pages 228 et seq. and 247 et seq. of this translation) he takes occasion to animadvert on the craniological doctrines of Dr. Gall; and produces what will be considered as the most formidable objections hitherto advanced against the system of that very able man; without however affecting the great and leading principles of Gall's theory, or the truth of his observations so far as they rest on observed facts. The puny sciologists who think themselves entitled to laugh at Dr. Gall, would do well to peruse the very honorable testimony to his knowledge and talents, which Broussais so readily concedes, while he controverts the imperfections of Gall's theory in its present state.

* Who can explain why gold is yellow and silver white? or why the same soil should feed the potatoe and the poison-vine?

In this volume then, the reader will possess, the most recent exposition of the physiological doctrines of medicine of the modern French school, applied fully and distinctly to a specific disease, and illustrated by the known causes, symptoms, progress and cure of that disease. He will also possess in this work the most complete refutation of the metaphysical doctrines of psychology, any where extant. In 1787, following the path opened by Dr. Priestley, I published in England what I thought to be a satisfactory refutation of those doctrines: circumstances elsewhere noticed, have since induced me to shew, first that the obnoxious doctrine of *Materialism*, is the doctrine actually held and maintained in the christian gospels by the founder of christianity; and also that it is true in itself, both metaphysically and physiologically. These tracts were drawn up in 1823 and published in Philadelphia; I have seen no reply to them yet. I regret, that in this country and among a people who boast of their being so enlightened, and in the middle of the 19th century, I find it expedient to fortify myself by Mr. Jefferson's coinciding opinions; but so it is: the value of free discussion is not yet appreciated as it ought to be in these United States; and the powerful enmity of the clergy and their ignorant adherents, is sure to pursue every man who exercises the right of discussing clerical doctrines and clerical claims. But I think the indications are manifest that their day is gradually drawing to its close. For the peace and happiness of mankind, I sincerely hope it is so.

The book of Hartley "On Man" is so little read among the medical profession here, and the doctrine of "Association of Ideas," so little known or attended to, that I have been tempted to give an outline of that doctrine, connected as it is with all physiological questions.

The volume now offered to the public, will be found to contain the *Elements of PHYSIOLOGICAL METAPHYSICS*, the only metaphysics in my opinion worth the attention of a man of common sense. Those who have studied Hartley, Priestley, Cabanis, Destut Tracy, and Broussais, will know how to estimate the vague and wordy discussions of the Scotch school.

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COLUMBIA, March 1, 1831.

PREFACE.

AFTER many vacillations in its course, MEDICINE has at length taken the only road which can lead to truth ; that is, *the observation of the relations of man with external modifiers,* and of the organs of man, one with another.* This method now universally prevails in writings, and in practice, whether it be avowed or not. This is the *physiological method* ; because it must be followed by studying the phenomena of life, which alone render the bodily organs thus modifiable. Let us, however, beware of mistake ; it is not the abstraction, Life, which is to be studied, but the *living organs*. If the observer wearies himself with investigations of *properties* or *forces*, considered independently of those living organs, or the natural bodies which have an influence over them, he will take much labor indeed, but he will fail in his object ; he will know neither organs nor agents ; he will know only the dreams of his imagination ; his head will be filled with illusions. It is thus that the ancients went astray, as will be seen in this work. The moderns have not escaped the snare ; and the same snare is even now preparing to be spread in the path of our cotemporaries.

Since then, true medical observation is that of the organs and their modifiers, it is in fact an observation of the body itself, and can be pursued only by means of the senses : hence the senses must furnish materials, and it belongs to the judgment to draw conclusions from them. But here a difficulty presents itself ; if the physician draws false con-

* *Modificateurs*. Whatever acts upon and excites any part of the animal frame, producing any alteration whatever in its antecedent state.—*Trans.*

clusions, or if he be so unfortunate as to forget the true source from whence they should proceed, he loses himself, and deviates into that mistaken road of which we have just spoken. Such an aberration is the more easy in the present day, as this false route is sanctioned by some distinguished men; by names that command respect and inspire confidence in the doctrines they advance. It is under the auspices of these respectable names, some of them dear to France, that *education, by means of the senses*, is depreciated, and threatened with discredit. Do not let us pass over an important distinction, and a practical truth. If the abstract words, *rights, lawfulness, disinterestedness, elevation of soul*, are adapted to produce actions, praiseworthy, useful to the public good and to the national glory, it is not the same with the words *vital properties, vital forces, vis medicatrix, specifics, contagion*, and others of the same kind, which, in like manner, paint the abstractions of the human intellect; for nothing is more easy than to abuse these expressions; that is to say, to impress under their sanction, on the living body, modifications hurtful to the health of particular men, and injurious to the good of society. Such a method of philosophising, although it may succeed in politics or diplomacy, is not always applicable to medicine; and if it be sufficient in those two sciences, to abandon ourselves to the sentiment of the beautiful, the sublime, and the just, without searching very profoundly in what manner we have arrived at these ideas, it is not so in medicine, where it becomes necessary to prescribe the regimen and treatment of a suffering fellow-creature, or to judge of questions that relate to the public health. These questions cannot be resolved by sentiment or inspiration; the modifying mendicaments prescribed, will not act directly upon *vital force*, upon *nature*, upon *principle*: they do not influence these abstractions, until after they have acted upon the organs; and if these last are injured by a blow, the evil which the abstract idea would have produced, will be in future without

remedy. In politics, on the contrary, the results of the application of a false principle may be calculated before the existence of society is compromised ; for nations are much more robust than individuals ; some victims there will be, but their sufferings will be perceived if the press be respected, and the mass of society may be preserved from similar evils.

Society then may proceed in the career of improvement, independently of first principles ; it may be rendered happy or unhappy in the name of God, of the Prince, or of the Laws : experience will settle which of these three motives produce the most durable good, or an evil of most easy correction. Moreover it is of little consequence in politics, whether the notion of justice or injustice comes from the senses, or from some interior revelation. The laws must be good ; and experience will soon pronounce on their advantages and disadvantages ; these become manifest to the public, and every one must at length acknowledge them. It is not so in medicine, while the evil produced by the circumstances that modify and destroy our organs, are attributed to diseases, as if diseases were separate and real beings ; and the reason of the mischief is, that empirical medicine never corrects itself ; experience is lost upon it, and it goes on with a satisfied conscience, sacrificing other victims. A just conception of disease, therefore, is the first object of medicine, nor can this be acquired without explaining in what manner this conception is formed ; that is to say, without probing to the bottom the real meaning of the words *vital properties*, *vital forces*, *vital laws*, for the purpose of understanding the words *putrid fevers*, *malignant fevers*, &c. &c.

It is necessary, therefore, that the physician should always have present to his mind, the *substance of the organs*, and that he should never forget that the abstract ideas of the science he pursues, have come to him by means of the sen-

ses, and that he cannot safely proceed to study man, by means of any *à priori* notions.

The object of this book, is to put this truth in a clear light, and to guard medicine from the dangers that threaten her by means of a philosophical sect essentially invading.—Hence the necessity imposed on us, to present to young physicians liable to be seduced by false systems, a true notion of Psychology,* which advances toward them with her banner unfurled, and already anticipates an easy conquest.

Introduced into the path of observation by the ideas of Des Cartes on method, and by the advice of Bacon—enlightened on the nature of the apparatus which we use for this purpose of observation, by the labors of Locke and of Condillac, the French proceed zealously and in concert toward the enlargement of every branch of useful knowledge. To this concert of effort, natural philosophy, chemistry and natural history, owe the progress which has distinguished them among ourselves, and which has enabled industry to soar so high. The turn of medicine has now arrived; the study of this branch of science, vague as it has hitherto been, has assumed more precision, since to the experimental method of the great *Haller*, it has added a comparison of the diseased organs with the symptoms, and the study of vital properties and forces in pathologic lesions. Professor *Chausier* by his excellent delineations, had so well traced the path to physiological observation, that it seemed impossible to miss it. *Pinel* had attempted the philosophical analysis of diseases, and if he did not perfectly succeed in this great enterprise, he at least struck out some ideas which the genius of Bichat has happily rendered fruitful of solid conclusions for pathology, by a faithful analysis of the tissues of the human body. We shall make observations in concert

*The doctrine of an immaterial soul, or principle distinct from matter, but some how or other connected with the human body, and presiding over its intellectual functions.—*Transl.*

with those of our predecessors; we shall profit by the advice of Condillac and improve our scientific language, while the profound and judicious Destut de Tracy, will render his able aid in this difficult undertaking, of which the fulfilment will alone preserve to mankind that knowledge which he has been at so much pains to collect; the wise researches of Cabanis, have given to our nation a philosophic preponderance, which will insure us from invasion by foreign sects. The beautiful doctrine of the relation between the physical and moral qualities of man, belongs to us through Cabanis, at least as much as it belongs to England; for Cabanis had made a step beyond our external senses; he had noticed the powerful effect of internal viscera upon our thoughts, which was not unknown to Epicurus, who furnished, however, no physiological demonstration of this truth.

These precious investigations have conferred on Physiology and Medicine, the exclusive right of dictating laws to Ideology, and promise to remove forever, any interference of the ephemeral systems of philosophical schools, with our science. We can now hardly venture to believe in any return of those scholastic subtleties, and those wordy contests which occasioned such loss of time to our ancestors.

So we thought, but we were wide of the truth. During the period that was occupied in France in observing the human frame, with all the precautions necessary to exclude illusion, and give us a just view of its nature, the metaphysicians of Germany and Scotland disfigured the nature of man, under pretext of rectifying the system of Locke. It was indeed necessary to rectify that system, but it was on the data furnished by Cabanis, and not by returning to the notions of antiquity and the recal of the system of Plato.

The French testified some disgust at the obscurity of Kants' system, which had been to them a frequent subject of raillery. It then became an object to naturalize it among us, under the specious pretext of making us acquainted with

the first disciple of the great Socrates ; that first martyr to the right of freedom of thinking ; the man whom every one had agreed to regard as a sage, and almost as divine. Was not this enough to stimulate the enquiries of our young men, greedy after every kind of knowledge ? Platonism, twenty times repulsed from the schools—Platonism which the French regarded with disdain, and congratulated themselves in having escaped its yoke, was offered merely as an object of literary curiosity. This was the first step taken toward disengaging us from actual observation of instructive facts, and replunging us amid the illusions and chimeras of Ontology. Natural Philosophy, Natural History, Chemistry, Mathematics, the study of History, at present truly philosophical, are walls of brass which Kants' Platonism can never subvert. Nevertheless, by favor of surprise it has made some steps among us, and some breaches in our ranks. The first object was to attack *Cabanis*, of far more consequence than Locke and Condillac. For Cabanis, although by no means free from Ontologism, had this advantage over his predecessors, that he appealed to facts which any one might verify, instead of confining himself to systematic speculation : in reflecting on these facts, it is hardly possible not to discover others equally fatal to Ontology. The Kanto-Platonicians foresaw this ; and without being fully aware of what might be discovered by the senses in observing man, they were desirous of obviating before hand, the results of observation which they could not prevent.—This is the amount of their present attempt, to place by the side of actual and sensible observation, and far above it, some pretended *internal* observation, which, if we believe them, is as much higher than the observation of our senses, as Morality is above Physics, Heaven above the Earth, or things sacred above profane.

For this purpose, some consecrated words have been chosen, with no small success, as *narrow* and *wide*, *low* and *el-*

evated, grand and little, and these are skilfully arranged.—Every thing that depends on the philosophy of the present day, is low and trifling ; all that flows from Kanto-Platonics is grand, noble and elevated. They attack our youth with arms formerly very efficient, with ridicule ; and they hope that men will fly to their ranks to avoid humiliating imputations.

I know not whether they have yet discovered, that ridicule changes its object as knowledge progresses, and that words have not at this day their former influence ; but whether they have discovered this or not, they have certainly changed their means of attack. Assuming the tone and language of religious fanaticism, they do not insinuate, but they loudly proclaim, that no man can be an estimable member of society, who does not belong to their party. It needs but little for them to condemn to the gibbet, those who are called Sensualists. Who can be the dupe of their officious zeal to distinguish such as are wanting in philosophy, and to draw from their silence a pretended proof of concealed acquiescence, or an inconsequence worthy of pity ?

Skilled in multiplying the allurements which they deem necessary to offer to our astonished youth, they give themselves out as eclectics, after having treated every other system as exclusive : and they say, or seem to say, “ O ye who aspire to true knowledge, hasten to us, and we will instruct you in all the doctrines of others, and preserve you from the misfortune of being seduced by any of them. For know, that all other philosophers are monomaniacs : raving on some one idea, and who will soon reduce you to their own situation.” What then is the eclectic philosophy of these men ? We now know it : they take their stand between Sensualism and Theology, but on the indispensable condition of being spiritualists. On this we have but a word to say ; if they are essentially spiritualists, they are not eclectics ; they can only judge of other systems as spiritualists, and they too are governed by one predominant idea.

They borrow from the sensualists all the facts of sensation, which they explain after their own fashion, they borrow revelation from the Theologians, but they modify it as they think fit. They are true reformers of worship, or rather illuminati who aspire to the universal dominion over conscience. Exclusives as spiritualists, they amalgamate different dogmas, even those that were heretofore held as contradictory. Such is their Eclecticism. It remains to be known whether its base be solid ; and whether they will be permitted to exercise the right of demonstration and of proof which they arrogate, and by which they set themselves up above all theologians who rest upon faith alone. This is a question which will be investigated in this volume, without entering into religious discussions ; for we make it a duty to respect religious belief in a treatise consecrated to Physiology, and the exposition of those facts which the senses are competent to verify. We do not aspire to the titles either of dogmatist or eclectic ; it is truth we seek ; and we seek it by those means of investigation which our organization furnishes. He who is in search of important fact, ought to be indifferent to the appellation which sectaries may bestow on him.

The pivot on which this eclectic Ontology turns, is powers (*forces*,) on which we shall make some observations to render our subject more comprehensible. The Kanto-Platonicians of France, affect the utmost contempt for *matter*, and have no consideration but for the powers that animate it ; and believe that by this means, they place themselves far above the observers of facts. We must see if by this puffing up, they are rendered able to rise higher than their opponents.

Let us examine what is meant by force or power. It is necessary to dwell upon this. What then is it, but the induction drawn by an observer of something which acts upon or within a body, producing therein some alteration ? The

observer is naturally carried on to suppose that the body is moved by something acting on it, as he himself is accustomed to act in certain cases on certain other bodies : no doubt there is a tendency to this conclusion. It is impossible not to admit that we are driven to it by analogy ; that is to say, we are compelled to judge of what we do not know, by that which we believe we do know : but it is here, and precisely here, that the fact stops. The man whose judgment govern his imagination, restrains himself, and laments that he is compelled to remain in ignorance of first causes. For him, the word *power*, *force*, is but a formula ; the sign of a perception which he has received from some phenomenon, and he makes use of it only to search for others which his senses may equally seize hold of.

It is not so with a man whose imagination governs his judgment ; a man of a poetical tendency ; a Platonician, ancient or modern : equally credulous and presumptuous, he cannot support the idea of ignorance ; and he passes from vague conjecture, to the most perfect conviction : he does more, he hastens to realize his induction ; he personifies it ; he makes it act as if it were an animated, living being ; in short, like a man ; then he frames his romance, of which this induction is the hero ; and he is angry at those who refuse to pay it homage.

Such is the fanaticism of opinion : it differs in intensity according to the character of the person in whom it is developed ; but it is at the bottom always the same. All authors of this description, whether in medicine, philosophy, or any other branch of knowledge, may profess toleration, but they are not capable of it ; they cannot be : they are too much attached to the fiction which has so agreeably occupied them ; to their poetic prose, and to the incredible efforts which useless researches have given rise to ; and looking at the picture for effect, they cannot support the idea that they have been occupied by chimerical reveries : they forgive a

brother romancer, although the portrait of his idol may be different from theirs ; but they never forgive a strict reasoner who pays them no deference, and passes by the temple of Ontology without bending the knee.

A figurative style suits marvellously the picturesque, and the fictions in which poetry deals : let it, if you please, be the style of idyls, or even of the epic ; but it ought not to be the style of philosophy, which it in no wise suits. Frequent experience since Plato, has taught us this : hence, young students cannot understand this figurative philosophy : they regard it with astonishment, and accuse themselves in secret of a want of intellect. There are always some, who by dint of listening, or of reading, succeed in figuring to their imaginations, some of those fantastic beings which this style portrays ; these, necessarily few in number, adopt the language of their teacher, and become violent in proportion as they were humble admirers of his sublime talent. As soon as these new adepts become unintelligible to their friends, and their conviction is carried so far as to make them smile with pity, and shrug up their shoulders at the names of Locke and Condillac—so soon as Cabanis is in their eyes nothing but an Atheist, happy that he escaped the severest punishment—so soon as Voltaire, Rousseau and Montesquieu, appear to them but sorry philosophers—that the works of Volney excite their indignation—and that the dryness of Destut de Tracy revolts them—their education is finished : they have no longer any occasion to study, or to consult the monuments of French literary glory, unless to criticise them, for they can find nothing of instruction in them ; they are far above these legislators of reflection and of taste : what they cannot find in the classics of their own school, they are sure to find in their own consciousness ; when discarding the senses, they withdraw within themselves, shut their eyes, avoid all noise, and listen to their own contemplations. When they have arrived at this high degree of perfection,

their features become composed, they assume an expression of pride, and they feel an inward conviction that their intelligence is infinitely greater than that of the persons who tell them with some surprise, "I do not understand you."

The moment, however, seems to have arrived, when we may tear away the veil which renders their masters impenetrable. We hope in this work to make known the secret of their apparent superiority; and the cause of that singular stupor which they have produced in the literary world.

It is to physicians that we shall offer the explanation of these mysteries; for it is their cause that we are now pleading; it belongs to the medico-physiologists to determine, what there is really appreciable in the causes of instinctive and intellectual phenomena. We address ourselves to physicians, because he who has studied nothing more than the regular and healthy physiology of the human being, does not possess facts enough for the solution of these problems. Man is only half understood, if he is observed only in health: sickness constitutes part of his moral, as well as of his physical existence. We must not, therefore, be surprised at the reveries of an Ontologist, who is a stranger to the physiology both of health and of disease; or who is content with a superficial knowledge of authors, whom he is unable to comprehend. Such is the case with the Kanto-Platonicians, and nothing is more strange than the pretension which they set up now-a-days to give laws to our science, especially at a moment when it is undergoing a stormy revolution, the nature of which they cannot understand. On all sides they find discussions of which they know not the true motive; truth and error, sincerity and dissimulation, honorable disinterestedness, and vile speculation imitating her language, are afloat, not in the whole medical world, but in the capital of France—in all the saloons—in all the academies; and the Kanto-Platonicians are at a loss to discover their own tenets: they know not what medicine is, and yet they dare

calumniate and despise it : they proclaim that the science of man, such as they conceive it to be, has alone any pretensions to certainty : without having passed even ten years of their life in studying man as physicians, or knowing him, considered in his organs, living and dead, they think that the external observation of the grown man, is sufficient to explain all the phenomena of the embryo, the infant, the diseased, the deformed, and the dead, submitted to anatomical analysis. The first observation is for them the only true one, because it is theirs ; the other is a vain and gross hypothesis, calculated for common understandings. It is of consequence to show them where the truth really lies ; in particular, to make them understand that a victory over a few deserters, or some speculators, who sacrifice to them a science which they do not understand, is immeasurably distant from a victory over medicine.

We will not do so much injustice to the French youth, as to believe they can be entirely led astray by the bloated language of the Kanto-Platonicians—the fund of good sense which distinguishes them, will doubtless preserve them now, as it has done formerly. But they may be confounded by the clattering of words which assail their ears on every side, and the schools of medicine will be surprised to hear, that this senseless jargon is to be introduced into the midst of the medical faculty, while so much opposition is to be made to the fruitful and intelligible doctrine of the Physiological School. We shall endeavor to explain this enigma, and make them feel the dignity of the science they cultivate ; and we shall prove undoubtedly, to every man who has consecrated the most valuable years of his life to anatomical, physiological, and pathological investigations, that the science which he has so laboriously acquired, neither is, nor ought to be, tributary to metaphysics, from which it can draw nothing useful ; and that so far from receiving its laws from this science of words, ought to supply them to meta-

physics which, like an ungrateful child, despises and denies its parent.

Following this great truth, we must collect the phenomena of instinct and intelligence around the excited nervous system, and give them an important place among the generating causes of irritation. We have not hesitated to adopt as the base of our work, the article *Irritation*, which we published in the *Encyclopédie progressive*, and which the public has favorably received. But the theory of irritation will receive in the following pages, a fuller developement than suited the plan of that work: so that this is in reality a new treatise on IRRITATION, which we now offer to our brethren. Since, of the four forms of Irritation, that of the nerves is more particularly developed in this book, as its importance required, and which we have hitherto refused to insist on, until time had matured our ideas,—we thought we could do nothing better than add to it by way of proof, a description of a correspondent malady. We have chosen INSANITY, as being the disorder in which nervous irritation plays the most important part. This subject suited us better, as affording new strength to the arguments which we oppose to the ambitious pretensions of the Psychologists.

In truth, our design in this work is, to unveil that mystery, under whose protection bad taste threatens to spread itself over the whole science of man, physical and moral; to contribute by a new effort, to the progress of physiological medicine, and to mark the causes which have prevented that progress from being more rapid; in fine, to pursue the science which we love, and to whose glory we have consecrated the greater part of our life, from being subjected to a disgraceful subordination.

It required motives like these, to induce us to interrupt the third edition of our *Examen des doctrines médicales*, which we have already put to press, and are sorry to delay so long; but that work shall be resumed with new activity.

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ERRATA.

- Page 29 for Stahl *formerly* read *formally*.
37 for *effections* read *affections*.
38 for *attributing to* read *adopting*.
39 line 9 from the top for *which* read *in which*.
44 line 9 from the top for *nothing* read *any thing*.
51 middle of the page for *principle* read *principal*.
72 line last, dele *if*.
95 line 13 from the top, for *the senses* read *your senses* ?
117 for ch. VII read ch. VI.
197 for B read D
213 line 16 from the top after symptoms add *of*.
216 line 16 from the bottom for *exercise* read *exorcise*.
230 line 11 from the top for *than* read *that*.
250 note for *organiologists* read *organologists*.
271 for 80 of Fah read 90.
272 line 11 from the top for *vegetable, fecula,* read *vegetable fecula.*



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R. J. W. BROUSSAIS .

Born at St. Mulo 17 December 1772.

ON IRRITATION AND INSANITY.

FIRST PART.—*On Irritation considered in its application to Health and Disease.*

CHAP. I.—IDEA OF IRRITATION.

The word Irritation represents to Physicians the action of irritating substances, or the state of the living parts that are irritated. We give the name of Irritants, to all those modifiers of our bodily economy which increase the irritability, or sensibility of living tissues, and which raise these phenomena beyond their (normal*) regular degree.

The word Irritation, is applicable to every living body, all of which are endowed with irritability ; but in medical language this word is used to designate the unusual increase of irritability, or of sensibility, among the higher order of animals. Our intention is, to consider irritation as applied to man alone, leaving to others the task of applying it to the veterinary art.

To say that a man is capable of irritation, is, no doubt, to say that he is irritable ; but the irritability, which is the property of every tissue, is not taken in a pathological, or morbid sense. We express by this word, the property possessed by the tissue, of moving on the contact of a foreign body, which induces us to say, that a tissue has felt that contact. Haller confined this property to the muscular fibre : it is now agreed, that it belongs to every tissue. When a man is conscious of the motions excited by a foreign body,

* *Normal* : within the usual and regular limits of the laws of healthy life. *Abnormal* what is out of those usual and regular limits from whatever cause.

which we frequently call a modifier, he is said to have felt the impression of that body, and we give to the faculty which he possesses of feeling or perceiving it, the name of Sensibility. Sensibility then, belongs to the individual, (*Moi*,*) and irritability to every fibre of the human body. A part affected by a foreign body, may be excited to motion without the individual (*Moi*) being conscious of it. In this case, there is nothing but irritability; but if the individual (*Moi*) experiences that kind of modification which induces the man to say, "I feel, I perceive," there is both irritability and sensibility. Sensibility, then, is the consequence of irritability, and not irritability of sensibility: in other words, we must be irritable, before we are sensible. The embryo is not yet sensible, it is only irritable: an apoplectic man is no longer sensible, but he is irritable. We see that irritability is common to all living beings, from the vegetable to the man, and that it is constant; while sensibility is a property belonging to certain animals only, and is manifested only under certain circumstances; these circumstances are the existence of a nervous apparatus, furnished with a centre, to wit, the brain; there must also be a particular state or condition of that apparatus, for it is not always in a condition to give to the animal a consciousness of the motions which pass within its tissue. The apoplectic man, and the embryo, are proofs of this.

Some persons have erected into a property, the faculty which the fibre possesses, of yielding to the impression of a stimulant, without the animal himself being conscious of it. They have designated this pretended property, by the phrase Organic Sensibility, because it is in such manner inherent in the organs, that it may be observed in them when separated from the collection; but as the movement of the stimulated fibre is the only phenomenon that is seen—as it is impossible to separate, to insulate the feeling from the motion—as the word feeling here, has no other meaning than self-motion—and as by like reasoning, the word feeling may be applied to inert bodies, since nothing hinders us from saying, that the ball which is moved, has felt the contact of the ball which is impelled against it.—This organic sensibility is a superfluous abstraction, which cannot find entrance into the exact language of philosophical physiology.

* *Moi*: one's self—that which constitutes me a different being from every other thing or creature. This seems, among the French metaphysicians, to be the expression for individual consciousness, personal identity.

The modifiers which put irritability into action, are called *excitants*, or *stimulants*, and their effect, *excitation* or *stimulation*. *Excitation*, considered under a general aspect, separate from the place where it exists, and the modifier which produced it, is also called *excitement*. When *excitation*, or *stimulation* exceeds the (normal) ordinary bounds, it puts on the character of *irritation*, and the agents which produce this, are called *irritants*. This is the *irritation* which forms the base of the physiological doctrine in medicine; but prior to considering it pathologically, and before investigating the part that it plays in the production, the course and the treatment of diseases, it may be useful to cast an eye over the eras of medical science, to discover by what gradations we have at length arrived at the point where we find ourselves.

CHAP. II.—HISTORY OF IRRITATION.

Hippocrates had no idea of *irritation*, but he admitted a consent among the organs, which he attributed to an internal principle (*enormon*) which a modern physician has translated *impetum faciens*, (producing an impulse;) by this occult force, he explained the phenomena of health and disease. The dogmatists, who followed the father of medicine, acknowledged a material soul, *etherial* or *igneous*, formed of whatever was most subtile in matter, and they made it pre-side over every vital action: this material soul held its place for a long time among the schools, sometimes alone, and sometimes as subordinate to an immaterial and imperishable soul, but they had no idea of *irritability* in the living tissue.

Neither is the theory of *Strictum* and *Laxum* of *Themison*, developed by *Thessalus*, *irritation*: it related to the facility or the difficulty which atoms experienced, in penetrating into the cavities appropriated to them; and the therapeutics which resulted from these hypothetical speculations, was absurd and without any relation to the modern theories of *excitement* and *irritation*. They proposed to open and shut the pores of all bodies which they considered like the skin, upon which they most frequently experimented. Hence they set to work by means of frictions; sometimes executed with substances attractive, sometimes astringent, repulsive, adstrictive, &c. and they emptied the body by vomits, by purgatives, and by regimen; to fill it again within a certain regulated number of hours or days.

Men who had no idea of anatomy, or of the functions of the body, conceived that by these practices they could empty all the channels of the system, expel the old matter, and introduce new, more proper to sustain health, and this they termed *metasyncrasy*, or *reincorporation*; they flattered themselves that by this pretended regeneration, they could give more force, suppleness, and permeability to the living channels; correct the excess of constriction or relaxation, and place them in that middle condition, most favorable to health and longevity. We see, then, upon what slight foundations it is asserted, that the notion of irritability is founded upon this system.

Galen developed the elementary and humoral theory of which the germs were found in the writings attributed to *Hippocrates*. He was the father of humoralism—he established forces to act upon the elements, earth, water and air, or *pneuma*, to convert them into humors, regulate their mixtures and their relations to each other, and enable them to direct the functions of life, and the conservative efforts of nature in disease. He lost himself in subtleties on almost every question he discussed, and had no idea whatever of animal irritability.

The doctrine of Irritation is not to be sought for in the oriental application of magic and the Cabala to the art of healing; nothing is there to be found but what is degrading to the human intellect.

The *Arabians*, who cultivated medicine with so much ardour before the invasion of the Turks, were mere copyists or imitators of *Galen* and the Greeks. They explained all the phenomena of life by occult forces, which they multiplied prodigiously. They were the founders of *Materia Medica*, and of Chemistry, but they had no idea of Irritation. Dissection was interdicted, and experiment was unknown. They had no anatomy, but that of Aristotle or of *Galen*, or of the Physicians of the Alexandrian School. Surely it was not from these sources, they could derive any just notions of the vital properties of the human body.

On the revival of letters, some authors, *Jerom Fracastorius*, for example, spoke of the irritation produced by the humours on the solids; but they built up no system on this vital action. The word Irritation is found among them, merged and lost amid a deluge of expressions, more or less faulty, belonging to the elementary and humoral pathology.

In this author, Irritation is considered in the abstract, and not as seen in this or that part, or as a state of the body.

During the 16th century, and the universal attack on the Galenical Theory, a Professor of the Faculty of Montpelier, *Joubert*, who first opposed "the dread of a vacuum," made use of Irritation to explain the phenomena of convulsions, which he attributed to the reaction of the solids against the morbid causes. He also attributed the action of medicines to a species of Irritation, viz. the disagreeable impression made on the stomach. Still the humoral pathology predominated; no system was yet founded on the irritability of the animal fibre. This, indeed was not even suspected, though manifest in some of the functions.

The Alchemists, the melters of metals, were for a long time occupied in discovering specifics and panaceas for the cure of disorders. *Paracelsus* their Coryphæus, imagined a kind of soul attached to the organs and residing in the stomach. He called it Archæus, and gave to it in charge, the government of the functions; but he did not assign to it Irritation as its prime minister, and irritability played no part in his absurd system of galimatias. Yet to one of the votaries of medical chemistry, *Van Helmont*, we owe the first notions clearly expressed of Irritation. Van Helmont admitted the Archæus of Paracelsus, and like him, placed it in the stomach. This physician was the first who gave a just notion of the local cause of Inflammation. He attributed it to the anger of Archæus, who, offended by the presence of morbid causes, sent a ferment into the part, which the Archæus always had at command. This ferment irritated the tissues, which called upon the blood, and thus became the immediate cause of inflammation. He exemplified this by a thorn forced into a sensible part, and thus gave an idea of the mechanical production of Inflammation. He attributed also to Inflammation some diseases which, till that time, had been very differently considered, such as dysentery, which he placed in the first rank of phlegmasiæ, declaring that it differed from pleurisy, only by the part effected.—His notion of the manner in which inflammation was produced occupied the famous article *Aiguillon* in the Encyclopædie, which has laid the foundation for the modern works on the vitality belonging to each of the organs.

But this idea had not all the success which we might have suspected; for, from the system of Descartes arose the physiologico-chemical school of Sylvius, the mechanico-mathe-

matrical and animal school of Stahl, who, for some time, turned aside the physicians from using the theory of irritation. It is true, that Van Helmont placed this phenomenon in the second rank only, and that his seeds of disease and his ferment, savored too much of the humoral theories, and his Archæus manifestly tended to place the soul at the head of all the physiological phenomena. This author may then be considered as the principal founder of medical spiritualism, but his irritation is too much separated from matter, to serve as a base for any reasonable theory of the irritability of living tissues.

Sylvius de le Boë, used the word irritation to give an idea of the action of acrid humors, which he conceived to arise from the fermentations, precipitations, and distillations, of which the human body was the continual seat. To blunt these acrid humors, he employed methods, more or less irritating: hence his theory does not rest upon irritability considered as a fundamental property of the body, and a source of vital phenomena; irritation was for him, only something accessory, frequently very ill applied. We may say as much of all his followers who, like Floyer, multiplied their acrimonies, and sought their specifics among the incrasating, always joined to irritating medicaments.

In the system of *Borelli*, one of the founders of the mechanical school, irritation plays an important part.—It is by this means, that the nervous fluid disseminated through the muscles by the action of the brain, determines their contraction. Irritation figures also in producing diseases; for the nervous fluid becomes acrid by the vitious action of glandular secretion, (although the blood does not participate this action,) excites fever by irritating the heart. But this appears to be the sum of their explanations, founded upon irritability; for their calculation of the force of the heart, and the fibres of the stomach—their dissertations on the effects of trituration—the velocity of the blood—the impulse of the molecules against the sides of their containing vessels—the influence which angles and curvatures produce on the course of fluids, and similar researches to which they always applied calculation, absorbed the attention of these physicians, and drew them aside from the principal phenomenon. It was elasticity, considered as a mechanical force, which formed the fundamental property of the living body, and not irritability, a word which was employed, not in a literal, but

in a metaphysical sense, to give an idea of the principle of action. Hence all the explanations of this school were mechanical, and most of the physicians that belonged to it were empyrics in Pathology, and mechanicians and calculators in Physiology. Hence, no doubt, the opinion which prevails at present among certain practitioners, that mathematical sciences can render no service to the practice of medicine.

Nevertheless, some physicians, convinced of the insufficiency of mechanico-mathematical calculations, to explain the movements of the blood, and the congestions in, and derangements of the secretory organs, had recourse to irritation, by means of which the blood is attracted, independently of the impulsive force of the heart. This irritation was, according to them, a vital phenomenon which they did not place in subjection to ferments, such as those of Van Helmont. Nevertheless, in spite of these flashes of reason over the physiology of life, irritation was nothing yet but an accessory phenomenon, not essentially inherent in the animal fibre, so as to force itself into the explanation of all Physiological and Pathological appearances. It was from this cause that the authors who were not mechanicians in Physiology, were always either humouralists or empyrics, whenever the causes of the treatment of diseases come in question.

Stahl formerly denied that the parts of the body were brought into action by stimulants, and that they contract themselves under the influence of stimulants: this was denying the fundamental point of the doctrine of irritation. He acknowledged no active power capable of producing motion, excepting the soul, which he borrowed from Van Helmont. It was the soul that perceived impressions; but this soul made use of tonicity as the only agent capable of producing motion, although the notion of making the modifiers of the body act immediately upon an immaterial substance, without counting any thing of the impression made upon living matter, and introducing this last solely for the purpose of producing a reaction of the spiritual being, seems strange and contradictory; yet, on studying the system of this physician, we cannot help perceiving that it was favorable to the progress of the theory of irritation. In effect, it was only necessary to place this phenomenon between the body impressed and the soul, just as he had placed what he calls tonicity between the action of the soul and bodily

motion, to perceive that irritation presides over the phenomena of health and disease. But the properties of the several tissues which compose our organs and other apparatus, was not sufficiently understood to lead readily to this conclusion. Nevertheless they employed the word irritation to give an idea of the manner in which the soul is effected by its modifiers.—It is the soul, according to the disciples of Stahl, which is irritated by the light that strikes upon the retina; and it is the soul which determines the closing of the eyelids and the contraction of the iris. One said that the soul was irritated by the impression of acrid matter which affected (not irritated) the nerves, and which excited fever. Another, *Robert Whytt*, acknowledged three species of muscular motion: one natural, another produced by nervous influence and voluntary, and a third, involuntary, produced by direct irritation. But the soul was always brought forward;* they always regarded it as the cause of motion, and to explain the motions which took place in a separated muscular fibre, they maintained that the soul was divisible, and that its presence in each portion of a divided heart, was the cause of the contractions which took place. They employed the same reasoning to explain the repetition of the contractions in a heart, torn out of a living animal, when they ceased to puncture it; they saw no mean between Mechanism and Animism, and if the heart did not move mechanically, it must move by means of the soul; they regarded as nothing the inherent irritability of the living fibre; they gave the same explanation of the irritations applied immediately to the nerves, and more or less prolonged after the substraction of the modifiers. This, therefore, was not the true theory of irritation. Others, nevertheless, pretended that the will always acted as an irritant upon the parts; this was one step more toward the truth, but the system was not yet generalized; indeed it could not be while irritability was separated from the living fibre, and while tonicity, the substitute of elasticity, was regarded as the principle property of tissues, and the abstract entity, irritation, was in this system brought into play, in lieu of the irritability of living animal matter.

Sauvages was mechanician in Physiology, and empyric

* No man who has glanced at the prevailing Physiology, and the prevailing Theology of any period, can doubt but the absurdities of Physiology must be ascribed to clerical influence.—*Transl.*

in Pathology : he subjected all the mechanical phenomena of the living body to the soul, and studied diseases by groups of symptoms, as is seen in his *Nosologie Methodique*. He had no just idea of irritation.

The reasonable soul of Stahl became now superceded by the vital principle. This was only changing the word. Thus, *Casimir Medicus* maintained that matter was of itself incapable of all motion, and that the irritation of tissues which had forced itself into notice, explained nothing without the intervention of this foundation-principle. Another author revived the material soul of the ancients, and assigned to it the same functions as the reasonable soul of Stahl. Each portion of the body was endowed with its peculiar sentiment and imagination, which was under the general government of this material soul. There is no assignable termination to the entities created and interposed between the immaterial soul and the organic fibres. But this arbitrary creation could not resist the progress of physical sciences. Nothing is seen in these hypotheses, but the system of Van Helmont under different colours.

Theophilus Bordeu admits in each organ a particular feeling. But he does not erect it into an intellectual feeling. Each organ being possessed of its own proper life, has also its own particular internal agents of irritation, which it draws from the blood, the nerves, &c. This author brought the glands greatly into play, conferred a principle of action on the blood, and submitted the whole to the vital principle, which in truth was not the reasonable soul of Stahl, nor an ethereal or igneous material principle like that of the ancients. It was something abstract ; the general result of the particular lives of the respective organs ; but it was also an active force which directed the mass of particular and special forces.

Irritation here is only a secondary means. It is not that force, which reflected from one organ upon the others, communicates motion and supports life : it is the general force, a result of all the particular forces, which feels the wants, calls in the means of supplying them, disposes the concert of motions, assimilating, depurating, conservating, reproducing, and directing the phenomena of nutrition. This is not yet the theory of Irritation. Shall I speak of the chimerical functions to which this author put the cellular tissue ? the pains and cachexies proceeding from the vicious

action of the different secreting organs, which the vital principle had to remedy by laborious efforts of coction, more or less prolonged, by crises, depurations, &c.? It is evident that the theory of Bordeu, though much superior to those of his predecessors, is nothing like the true doctrine of irritation.

It carries also with it an impression of Animism. It seems to give ideas and action to a principle, and to principles of which no one can form a precise idea. It is so far good that it unites these principles to particular organs, so that you cannot think of the one, without contemplating at the same time the other, and their modifiers. As to the theory of Coction, and efforts made with irritation, this is a remains of the Ontology of the Hippocratic Schools.

La Caze, so much thought on by some, spoke of irritation; but he nearly confined it, in the production of vital motions, to the tendinous centre of the diaphragm which he considered as nervous. He wandered so far from the truth, that we cannot place him among the physicians who contributed to the progress of the theory of Irritation.

These errors would not have been committed, if physiologists had been content to reason on facts well established. But the mad propensity derived from the ancients of guessing at functions instead of studying them; and that other not less erroneous of considering every thing abstractly—of talking for a long time about functions without noticing the organs to which they belong—of placing the organs in a subordinate point of view, and creating some immaterial being to hover over them, and direct all their movements—this Ontologic mania was as yet too fashionable to permit physicians, under the influence of their imagination, to escape from it. On the other hand, wise men, who had no anatomical and physiological analysis to resort to, for no one had as yet established such a branch of knowledge, had no resource but to empiricism or scepticism. But scepticism prescribes no formulas, and diseases demand them. There was no remedy, therefore, in medicine, but empiricism and a renunciation of physiological reasoning. Content with a superficial view of facts, exclaiming with Horace, *Permitte Divis cetera*.

Barthez, a noted favorer of the vital principle, placed in subordination to it too many particular forces, and brought it upon the stage as a kind of intelligent soul: although he

protested to mean no more by this than the cause, whatever it might be, of vital motions. This author admits also of humoral charges, founded partly on the theory of the Galenists, and partly on that of Bordeu; for he strove as much as possible to make the different theories agree. He regarded irritation as a secondary phenomenon, and did not make it the base of any regular system of Physiology, or of Medicine.

Ernest Platner, in his great work on Anthropology, admits a nervous spirit, a kind of material soul, which he proposes as the general instrument of the immaterial soul. The organs pump it out of the atmosphere: it corresponds to the *Pneuma* of the old physicians. It is an emanation of the general soul of the world, and proceeds from the ether.—This material soul, diversified in each organ, produces therein sentiment, desire, aversion, and explains all phenomena. In this explanation irritation acts but very feebly.

Hitherto nothing appears on irritation but what is vague. Arriving at *Francois Glisson*, we shall see something more precise. Without entering into the details of the system of this philosophical physician, we shall remark, that he ascribes to each animal fibre, a property which he terms irritability, and of which the results are perception and desire (appetit). Perception differs from sensation. Perception precedes the motion which is the effect of irritability, and is converted into sensation so soon as it reaches the soul. This perception is natural to the fibres; the nerves possess it; it renders the fibres irritable; it is the source of natural movement, which the author distinguishes from sensitive movement, the result of sensation. The soul having received a sensation from a natural perception, acts upon this for the purpose of moving the muscles, without acting immediately on the muscles. The will put into action by the soul, acts upon the irritable fibres by means of the nerves, or their natural perception. Irritability is divided into natural, vital and animal; and the humors partake of it. There are vital spirits also, intermediate between the immaterial soul and the organs. The sympathies between these two, are explained by the communication of animal irritability.

In spite of all this Ontology, it is easy to see that the first theory of Irritation is comprised in Glisson's, and the germs also of the theory of excitement. To find this, it is only necessary to take away the immaterial beings which he has

placed between the impression of the excitants and the movement of the fibre ; and then will remain the irritability of the fibre, and its result, irritation. Still this irritability is too general, too vague. It becomes necessary to appreciate its degree and its function in each tissue. This precision, however, belongs to a period much nearer to our own. But we shall see that the first notions of the theory of excitement must not be refused to *Hoffman*.

Irritation occupied an important place in the system of this author, but it did not form the basis, of that system. The blood contains an etherial fluid which it dispenses to all parts of the body ; which is secreted in the brain, and distributed in the nerves. This fluid is the first mover of life ; it is this which gives irritability to all the tissues ; it is the intermedium by whose aid the immaterial soul acts upon the body ; it constitutes of itself a sensitive soul, and each of its parts has an idea of the mechanism of its whole organization. It is according to these ideas, that the material soul forms a body for its own habitation ; she takes care of it, she repairs it, &c. &c. We can easily see that the thinking particles of this sensitive soul, do not differ from the Monads of Leibnitz.

Is there any question of the movements which are executed by this sensitive soul ? Hoffman studies and explains them by Mechanics and Hydraulics. Life consists in the preservation of this union, through the movement which is produced by the spirit contained in the blood, and it is this movement which keeps up the animal heat.

Independently of this movement, Hoffman admits another, which he regards as fundamental ; that is, the diastole and systole of the membranes of the brain, or meninges, already discovered by Pacchioli and Baglivi. It is this new motion propagated in the dura matter of the spinal marrow, which forces the nervous fluid into the different parts of the body. The excess of this motion furnished him with the explanation of convulsions. In general, diseases depend on irregularities in this motion, or in the imperfect mixture of the humors produced by the faulty action of the spirit, disseminated through the blood, whose mixture it does not properly regulate. Excess of this motion produces spasm ; when too feeble, the result is atony ; while the faults of the mixture engender humoral diseases.

Hence arose a pathology, arbitrary and fantastical. We

see clearly that the physicians of that day, to whatever sect they belonged, were embarrassed by the obligation they believed imposed on them, to make room, some how or other, for an immaterial soul,* and to explain its relations with every part of the body. *Descartes* located this soul in the pineal gland; others placed it in other parts of the brain; but *Hoffman*, brought up in the school of *Van Helmont*, distributed it to every part of the body. The great difficulty to be overcome still remained: that is, the contact of an immaterial substance with matter. They had long been in the habit of extricating themselves by means of *spirits*: that is, a subtile matter, more or less like ether, from whence they frequently derived it; but as these kinds of gasses were capable of contact, in part with the soul, and in part with the organs of the body, they had only to explain their operations, by the Chemistry or Philosophy of the day. Whether they employed two souls, and two sorts of spirits, or one, the idea was at bottom the same. *Hoffman* sometimes made his soul and his spirits mechanicians, sometimes chemists; at other times they seem to put the molecules into action according to the blind laws of vegetative life, as if these molecules had not labored under the eyes of their immaterial principles, and in some measure under their hands. His pathology conducted him to stimulants, though he abused them much less than many others. All this is very unlike the true theory of Irritation, toward which, *Hoffman* had not advanced so far as *Plattner*.

Hitherto, irritability had been considered confusedly and always abstractedly. The great *Haller*, first of all determined by precise experiments, what tissues were really irritable: the result with him was, that their property was confined to the muscular fibre. Of the other tissues, some, like the nervous, and those which were abundantly furnished with nerves, were endowed with sensibility only: others, not the fewest in number, were declared to have neither sensibility nor irritability, but a *vis inertiae* only. The connection of the nerves, which, according to *Haller*, produced nothing but sensibility, served to explain the sympathies, or the propagation of excitement from the fibres of one part, to those of another.

This theory was a great step gained; for it gave consistence to ideas, before that time, too abstracted to fix the

* An obligation imposed on them by the clergy.—*Transl.*

attention of strict reasoners, and too difficult to convince them. But it did not furnish a sufficient reason of the phenomena of motion, particularly such as took place in the numerous tissues to which Haller had refused both irritability and sensibility, and allowed them only a *vis inertiae*; for what idea can you have of a *vis inertiae* in a living body? The cellular tissue, and the organs, which, according to that author, are formed out of it, such as the tendons, had no distinct properties. How then could be explained the union of these tissues with those that were sensible or irritable? Besides the first defect, Haller's system had a second, not less weighty. Sensibility, that part of the ancient soul, became materialized, when it attached itself to the nervous tissue, and assumed an heretical character, when taking its place by the side of the irritability of the muscular fibre. This, of course, excited grave suspicions among the physiologists and the philosophers. Notwithstanding all the efforts they made at that time to remedy this very inconvenient materialization, and which encroached upon the domain of the soul, it has remained even to our day; and our spiritual philosophers cannot get rid of this cruel thorn, but by interposing the soul between the Almighty and their sensibility, just as the ancients interposed spirit, or ether, between the soul and matter. We shall of course consider this subject again, by-and-bye.

Nevertheless, the successors of Haller perfected their theory as far as they were able. One re-established the irritability of Glisson, and made it the source of all the motions of the body, dispensed it to every tissue, and assigned to the nerves alone, the power of exciting, and of putting it in action. Some time after, another proved that irritability was independent of the vital spirits, and belonged originally to the fibres; for he demonstrated it in zoophytes and in plants. Others showed that the essence of the human body, consisted in the re-union of the forces of its several tissues. They saw that irritability remained in those parts whose sensibility had been destroyed by tying, or cutting the nerve, distributed through them; they specified the external agents which excited, diminished, extinguished, or exhausted it by excess. (Works of the school of *Winter*.) These exciters of irritability assumed the name of stimulants, which they have kept to the present day. Many authors went so far as to deny the existence of the nervous fluid.

Many disputes arose concerning the sensibility of different parts: some refused to allow it in conformity to the experiments made on living animals; they pretended to judge of it, rather by the pain excited by the inflammation produced, than by the presence of nerves. They maintained that contractility is an original property of living matter, and therefore that every part of the body, without exception, is endowed with it. This opinion found many supporters. Thus by degrees the bases of the theory of Irritation were laid down.

After such facts established, how was it possible to remain so long adherents, to medical Ontology; how could every thing remain in doubt, and how could medicine come down to our day, without having been able to associate itself definitively with Physiology by the intervention of irritation?

Peter Anthony Faber, however, gave it a valuable support. He demonstrated better than any one else, the irritability of the capillaries, independent of cerebral innervation. He remarked in frogs, that the blood followed all directions, sometimes a course retrograde in the small arteries, and direct in the small veins. *Dr. Sarlandiere* repeated this experiment before us, by placing the mesentery of a frog in the focus of a microscope. We had ascertained that the molecules of the fluids came from all parts, convergingly even across the veins, toward the point irritated by the puncture of a pin, and were there accumulated so as to form a congestion. At length the molecules of the circumference were able to disengage themselves, and take an inverse direction if you establish a new point of inflammation in the neighborhood of the former. This fact became decisive in the theory of many inflammatory disorders, and of the effect of revulsion. Faber had made a very happy application of this fact to the theory of inflammations. If it was not satisfactory in his hands when applied to fevers, it was because he had not viewed these effections as phlegmasiæ.

In fact, while fevers were not reduced to a phenomenon of inflammatory irritation, they remained within the domain of the vital principle, a kind of immaterial soul, but perishable—subordinate to the immortal soul, but strictly connected with it. This foreseeing principle—this interior providence of Hippocratic origin, all whose doings had a purpose to be guessed at, reduced the business of a Physician to that of an Augur or Aurspex, at least in the greater number and most

prominent of the cases, and especially in those which were most interesting for the multitude and mobility of the scenes they presented. How could a series of notions so incomplete, for the most part, associate themselves to irritability so as to become a real science? Was it not necessary to throw down this monstrous colossus of specific fevers, so laboriously raised by the successive efforts of physicians, from the very first epoch of civilization?

This new theory of inflammation, which consisted in attributing to a local irritation, attractive of the neighboring fluids, furnished in all cases the means of attacking with success, the system of *Boerhaave*, on the obstruction of the small vessels, by the globules of the blood, as being the cause of inflammation, and furnished a better foundation for the therapeutics of disease; but physicians did not derive all the advantages of which this theory was capable, for inflammations were too confined, and systems were afloat which diminished their number. Ontology was too powerful at that day, to permit the full developement of the theory of irritation, and the physiological doctrine of medicine.

Some established an identity between nervous power and irritability, and made the soul contribute to all the irritative movements; but as it was proved that irritability did not depend on nervous influence, these notions did not gain ground. Innervation is for the fibre no more than an exciting cause to put it in action, and which renders irritability more marked and distinct.

Hence arose the nervous theory, which took its origin at Edinburgh, and of which *Cullen* was the father. He deduced it indeed from the doctrines of *Hoffman*, who frequently sought for the cause of disease in the nerves. But *Hoffman* made the nerves subordinate to the *dura mater*: he made this to act mechanically, so that the causes of disease were with him mechanical: he admitted also of humoral diseases, which *Cullen* rejected, referring every thing to the modifications of the nerves. *Cullen* is properly the father of solidism, although he often wanders. He combined the notions of *Hoffman*, with vital forces.

In his theory of fevers, he sets out from the principle that all the causes of these affections are debilitating. This debility exists at the surface; and the reaction of the *vis medicatrix* excites the powers of the body and produces heat; but the debility at the surface exists during the whole

progress of the fever. The internal coat of the stomach partakes of it.

The diminution of energy in the brain, is the first cause of that in the skin. Spasm succeeds atony, and the mutual reaction goes on. Hence, Quinquina and other tonics become specifics in these cases.

Cullen attributed inflammation to the irritation of the sanguineous capillaries. Rheumatism is a type of this state, which visceral phlegmasiæ are passed over. The gout differs greatly from rheumatism, as being a disease of the whole system—a nervous debility arising from atony of digestion. This atony assumes periodicity, in which the gouty fit arises from congestions taking place at the articulations.

Irritation becomes in this system an important agent, but almost always a secondary one. This is a bad use to put it to. The author makes it arise from debility, and in vain we ask, what is the primitive debility in those disorders which are more successfully treated by debilitating the patient, than by exciting him, with a view to give strength? Irritation is not in its proper place here, nor is this the doctrine of Irritation. Cullen, moreover, passes by many diseases. He admits, against his own principles, of acrid humors, and dwells almost always on cure by tonics. It is to Cullen we owe the tonic therapeutics in fevers, and in those chronic affections where he always saw relaxation of the stomach. These notions supported by his disciple *Brown*, have prevailed in the European schools even to this day.

The atony which here appears again upon the stage, is the *laxum* of Themison, who located it in the vessels. But it had been already presented under another aspect, for Stahl had acknowledged the general relaxation of fibre. Hoffman rather placed it in the nerves than the vessels. Cullen saw it in every tissue. Nature no longer struggles, as Boerhaave supposed, with a stagnation of the fluids. He has now to contend according to Cullen, with relaxation converted into spasm. The disciples of Boerhaave at least, left some energy in their organ of reaction: irritated by the obstacle which stopt the blood it would otherwise have pushed forward, the heart redoubled its vigor, and its increased efforts produced inflammation and fever. This anger of the heart, substituted for the anger of the Archæus, was in truth gratuitous, but it involved no contradiction.

Not so with the "tonico-spasmodic system of Cullen : the atony was not confined to the skin and the surface-vessels, but extended to the stomach and particularly to the brain ; a thoughtlessness surprising, considering that in this system the nervous apparatus was the chief organ of life, and the source of all reaction. For if the brain be in a state of debility, we see not whence that reaction is to come, which raises up a fever to overcome atony and spasm. If Cullen had been an animist, one would have supposed he would have assigned this part to the soul to perform : but he talks of nothing but nature, life, and matter. In his system, therefore, we are driven to suppose that the vital principle, something different from matter, acts upon it and produces reaction.

Still, Cullen rendered great service to medicine, by shewing the true manner in which medicaments act. He has enabled us to banish specifics, by shewing that medicine acts only on the nervous system. They act indeed first upon the stomach, which by its numerous sympathies acts upon every other part of the body and corrects the tendency to disease ; which was as much as to say, that they did not act directly or specifically on the morbid entites, which diseases were considered to be. It is true, Cullen usually proposed to increase the tone of the stomach ; but he was not blind to the relaxing and dissolving properties of emollient medicines, or the vital reaction which rendered astringents and narcotics irritating. With such principles, we might have been led in due time to perceive, that therapeutic agents did nothing but modify the vital properties, and augment or diminish the excitation of the organs. He therefore furnished to the doctrine of irritation, a foundation which subsequent observers might render more substantial.

James Gregory, a Professor at Edinburgh, and one of the proposers of the new nervous theory, pretends that every thing is nervous in the animal economy ; and doubts whether sedatives directly diminish irritation ; he is inclined to regard them in the first instance as irritants. This notion adopted by *Brown*, and from him to *Ravari*, has served as the base of all the disputation on excitement.

Samuel Musgrave, of London, was of the same school. Every disease even to dropsy, typhus, and contagion, were affections of the nervous system, and medicines acted only upon that system.

De la Roche, (analyse des fonctions du systeme nerveux)

professed similar principles. Like Gregory, he established a distinction between the rapidity and the intensity of nervous phenomena ; the first increases as the latter diminishes. Stimulants according to him, increased the rapidity, tonics the intensity of nervous action. This theory has gained ground. Even at present a distinction is made between excitation and tonic action ; but this latter is only a shade of the former, which according to the physiological physicians, is in fact the same.

According to *Albert Thaer*, fever is nothing else than an excitement of the nerves of the vital organs ; whence results an increase of irritability in the heart and arteries. He repeats after *Baglivi*, that crudity in fevers is the result of spasmodic and irregular contraction ; and when the spasm ceases, a healthy coction succeeds. These expressions are vague, and the seat of spasm is undetermined ; but we see clearly that the doctrine of irritation promises to become the prevailing system. *Stoll* himself, with all his humorilism, entertained the notion that fever and inflammation were owing to the augmentation of irritability in the heart and arteries, and *Selle* did not hesitate to place the cause of fever in a particular disposition of the nervous system, which can only be referred to irritation.

The theory of *Schæffer*, physician at Ratisbon, is much nearer what we acknowledge at present in France, although it differs, as we shall see, in many essential points. According to him, all diseases depend on an unnatural irritation of the nervous system. Excitement, crudity, coction, are all nervous. Critical evacuations do not decide upon febrile diseases ; they are nothing but relaxations produced by the cessation of spasm. This author pays more attention to nervous affections and irritations, than to pretended acrimonies. Medicines act upon the nerves of the stomach, and bring the sympathies into play, by aid of the great intercostal nerve. Here is, without doubt, an important position taken, to found thereupon the theory of acute disorders ; but we want intermediate facts to render it useful. The author deduces from his theory, the necessity of emetics to shake the system powerfully, to overcome spasm, to hasten coction, &c. &c. But to recur to irritation, for the purpose of overcoming irritation, without having revulsion in view, (that is to say, without meaning to create a new and counter irritation) and to suppose that irritants have a specific

anti-irritative effect, as he supposes after Rasori, is to entertain a false idea of the irritability of the tissues ; for the proper view of the subject is founded on the knowledge of the mode of action of internal fluids and external agents upon the same tissues ; and a just notion of this mode of action constitutes the true science of medicine.

We find in *John Gardiner* an excellent application of the nervous theory of that day. He attributes catarrh, to a transfer of irritation from the skin to the air passages. What more precise can be said of the sedative action of cold ? And why did not the other parts of the theory agree with this ?

Some classifiers have reproduced in our day, a system explained by *Vanderheuwel*. This author based it upon the different aberrations of vital energy ; the genera of disease, rested upon the disorder of the general functions ; and the species of disease, on the disorder of the special functions. This gave us diseases arising from excess of general, and diseases arising from excess of local irritability. The fault of this system has already been shewn : you cannot separate the vital properties of the organs from the organs, to make these properties as distinct entities, preside over organic affections. You must study the lesions of these properties in the organs themselves that are diseased, and not the lesion of the organs in the disease of the properties : these last are chimerical entities, resulting from medical Ontology. (The property of any thing by which it is known or characterized, is not an independent being, separate from the thing of which it is a property : it is not a noun substantive but a noun adjective, as a peculiar yellow brilliancy is the property of gold. It is the thing itself.—*Trans.*)

All these efforts shew that the attention of physicians was no longer voluntarily directed to chimeras, although from the influence of prevailing prejudices, they were undesignedly led in that direction ; but their intent was to rest upon the phenomena, from whence we derive our notions of life. These phenomena were known in a great measure—no one could lose sight of them. It required only a good and clear method of studying them, which they were yet far from possessing.

Henceforward the soul of Stahl presides no more over diseases : vital force, nature, were substituted ; and the Animists [or Psychists,] had become Solidists. According

to *Vacca Berlinghieri*, Professor at Pisa, we ought no longer to talk about humors. It was necessary to study the solids and the forces that animate them. No more of putrefaction in the circulating fluids ; this takes place not within but out of the vessels. The constitution of the atmosphere alters the humors only by acting on the solids. He admits a principle of reaction which is the cause of salutary and morbid changes, and is in fact vital energy ; and medicine acts by means of the substances prescribed, on this vital energy. The base of this theory is good ; not so its application. Physicians dwelt as yet among important generalities. In spite of themselves they were drawn on to consider the vital principle as some separate abstract being : irritation was not studied in its actual effects on each organ, nor was the connection traced between the irritability of each tissue and the irritants actually employed.

Grimaud, Professor at the school at Montpelier, was among the vitalists, but in a peculiar way. He discovered a great affinity between nervous diseases and fevers. He observed among the phenomena the principle of reaction. The heat and cold of fever are equally affections of the nerves. But the faults of the humors, (the fluids) are not the result of those of the solids, for the vital principle acts equally on the fluids. These fluids then have their appropriate diseases independent of the solids. This modification of the humoral pathology, adopted also by *Bordeu*, has always had its partizans. But to adopt a vital principle which sometimes hovers over the solids, and sometimes over the fluids, separated from both, is Ontology. (It is *Protopopeia*.—*Trans.*) To see morbid entities all ready formed in the fluids, before the solids are affected by them, is illusion and chimera. The fluids, as we shall see by and by, may contain a cause of disease resident for sometime within themselves, but the disease itself does not reside there. To make the curative modifiers act upon the fluids instead of the solids, is another illusion supported by no fact. Whatever part we choose to assign to the living solid in that theory, we can see nothing that induces us to confound it with the doctrine of Irritation.

Notwithstanding all the labors of the solidists, they had not yet extended unity to the different phenomena of the animal body. Most of the physicians were inclined to separate as *Haller* did, nervous energy from muscular irritabili-

ty, so that the irritation of the nerves was not like that of the muscles ; nor had they any idea of the irritability of tissues, which Haller had condemned to *vis inertię*. They sought to establish this desirable unity, by saying that the nerves are the base of all the tissues, and that in fact every theory is reducible to nervous substance. But this hypothesis could not mislead the anatomists ; and it found itself at variance with the practitioners, who could not bring themselves to see nothing but nervous modification, in the influence exerted by the causes of disease, and the action of remedies. On the other hand, the vital principle was not sufficiently of the nature of matter, to be put in connection with the agency of external substances : and it was not to be concealed, that in seeking to modify it according to prevailing theories, the results were not always satisfactory.

The uneasiness which arose from this unpleasant state of uncertainty, hurried many able men into empiricism, till the system of *John Brown*, (Johannes Bruno, as he was often called—*Trans.*) long unknown and neglected, began to spread, and attracted strongly the attention of physicians in general. Brown had been a disciple of Cullen. He adopted like Cullen the notion that debility was the cause of many diseases ; but he did not convert spasm into a distinct being. He saw but one modification of debility ; and he rejected the whole humoral explanation. Brown borrowed from Cullen the idea that remedies were not specific ; and he acknowledged but one modification of life in its action on the organs. He discarded the words “vital principle ;” nor did he trouble himself in reducing all the functions to nervous phenomena. He seized upon two ideas, excess and defect of excitement ; and made these equivalent to excess and defect of vital force. The hypothesis of *strictum* and *laxum* had been already advanced. Brown connected these two expressions with his own theory ; so that excess of excitement, or of vital force was excess of tone, *strictum*, while *laxum* became defect of excitement and vital force.

Brown laid it down as a principle that life is kept up by excitement ; and to live is nothing but being excited. Thus far all was just. It is manifest that whatever it be that makes us live, it is reducible in the eyes of an accurate observer to those phenomena, which we include under the term life : these phenomena go on with decreasing effect and seem disposed to wear out. But to make use of this principle, we

must study each part of the body in its relation to the external agents of excitation, and ascertain how the respective organs mutually excite each other ; and we must attentively study the effects of internal and external excitants, on each of the tissues of which the bodily organs are composed. Brown neglected this : for this manner of studying excitation, is no other than the modern physiological method of the French school. Let us see then what Brown did, and what was the cause of his mistakes.

He considered excitation abstractedly ; separately from the excited organs, and he threw himself by his very first step among the Ontologists. Then he applied to the organs his reveries on excitability. He held that excitability, in a general view of it as a modification of life, is consumed and worn out by excitement and the action of excitants ; it is then accumulated by rest, or the absence of excitement. From this view he deduced many consequences by no means just. Hence with him, a moderate excitement sustains the equilibrium of the vital forces, as no person will contest : a greater degree of excitement produces an increase of strength, and becomes a source of sthenic disease or disease from excess of force. A still stronger excitement exhausts excitability and produces debility or indirect asthenia. Direct asthenia, is the consequence of defect of excitement. The more this defect is increased, the greater is the quantity of excitability accumulated, till it becomes excessive. Brown formed a regular double scale, representing on one side, all the degrees of augmentation and excitement by the action of stimulants to the highest degree, which then became converted into indirect debility or asthenia ; and on the other side, all the degrees of augmented excitability by reason of want of stimulus, till direct debility or asthenia was induced, as far as extreme weakness, terminating in death.

It cannot but be felt how absurd is a theory which places the highest degree of excitability at that moment when excitability itself is about to be extinguished by death. But this is not the least fault : the great objection is, that it led the Brunonians on to a most fatal practice. The false position that the vital force constantly diminishes by a high degree of excitement, introduced to make room for indirect debility, led Brown to treat by excitants all those inflammatory affections, which overwhelmed and oppressed muscular

motion. The opinion not less erroneous, that whenever excitants had acted in a less quantity than usual upon the system, excitability accumulated was to be consumed and used up by excitants, compelled him to employ those kinds of modifiers to all persons who were affected by chronic disorders. Brown placed all excitants on the same line; aliments and the fluids contained in the vessels, formed the principal part: hence it clearly followed, that if persons were more lean than in their usual state of health, they had not been sufficiently excited, and therefore they must submit to excitations. But the physiological doctrine of our day teaches us, that the greater part of chronic diseases are inflammations produced and kept up by excitants, and must be cured by practice conducted on opposite principles.

Had Brown studied excitement in connection with, and as it appears in the organs themselves, in lieu of treating it by personification and abstractedly, he would have avoided these errors. He would have acknowledged that persons whose regimen is too exciting, instead of becoming as he supposed less excitable, are more so, and end by being unable to bear any further excitation. He would have understood that excitability may be augmented in some organs of the body, while it is diminished in others; for instance, when persons who have indulged to excess in alcoholic liquors, fall into a stupor with violent fever, they are easily excited at the internal surface of their digestive organs while their surface is torpid. Had he been convinced of this important truth, he would not have treated acute disorders by wine, by bark, and other stimulants of that kind; and humanity would not have had to deplore the astonishing progress which his system has made, even within our day.

Had Brown carefully observed persons, enfeebled and emaciated by diseases of debility, he might have assured himself that their leanness was owing to their being too excitable, or having been too much excited, and not for want of it, consequently we could not hope to diminish their excitability by any new excitement. Had he made this remark, we should not have seen many physicians in these days, treat patients, afflicted with chronic diseases, by stimulants, and thus hasten the disorganization of their viscera.

The abstract speculations of this author on excitability, did not disclose to him the laws of this phenomenon. He never saw them but in cases where patients already too much

excited were cured by excitants ; but this is to be ascribed to revulsion ; that is, where there is a change of the locality of excitation, transferred from organs of the first necessity to life, to another set of organs or to tissues of secondary importance, which are often sacrificed to preserve the more essential ones primarily affected. Brown did not perceive that these fortunate crises were so uncommon, that in a great majority of cases the exciting treatment destroys the principal organs, or produces diseases of debility almost always incurable.

But Brown was neither a practitioner or an anatomist, nor in his day was the degree of vitality of the several tissues sufficiently known, to render it possible to observe accurately their excitability, or to obtain a just idea how excitation was transmitted from one to another ; a system of analytic anatomy was wanting ; and a nation was wanting which possessed a *Chaussier* and a *Bichet*.

Such is the substance of the famous *Brunonian system*. It was not rigorously adopted in the schools of medicine. Some modified it without changing its basis ; in others it was made to amalgamate with the humoral theories ; that is, the treatment was sometimes applied to peccant humors, and sometimes to excess or defect of vital force. Others adopted a kind of empiricism, wherein Brown's theory indicated the curative treatment. Each disease was regarded, not as an affection of this or that organ, but as a group of symptoms bearing a certain name, and requiring as a matter of course, debilitants or tonics. When the patient was visited, the symptoms were counted and noted, without noting what organ was affected, and furnished them. To this collection of symptoms, a name of that disease was given, to which they seemed to have most relation. The name was drawn from ancient authors ; but as to the treatment, that was drawn from the Scotch practice. If the disease was of a sthenic character, according to Brown, debilitants were exhibited : if it appeared to be asthenic, stimulants were preferred ; and this was most frequently the case.

This method was not always strictly pursued, for none of these systems had any regular foundation. For instance, among febrile diseases, somewhere called after the part affected pneumonies, peritonitis, hepatitis ; others after the state of the patients strength, as adynamic (or typhoid) fevers, sthenics or asthenics : some were denominated from the

nature of the fluid secreted from the parts affected, as catarrhal, mucous, bilious fevers ; some from the danger accompanying them, as pernicious fevers ; some from the surprise or apprehension they excited in the physician, as malignant, irregular, or ataxic fevers ; others from certain accidents accompanying them, as syncopal, painful, nervous, &c.

The same confusion prevailed as to chronic affections. Dyspepsies qualified according to the difficulty of digestion ; hypochondrias named after sensations referred to the region of the hypochondria from obstructions imperfectly understood ; cutaneous eruptions and scrophulas whose relation to the stomach and bowels were not well known. In treating these ailments, sometimes, they would dissipate a congestion without regard to the excitement produced by the medicines applied ; sometimes they would make a determination to the skin, without considering the gastric stimulation necessary to produce sweat ; in many cases a virus was attacked by methods which only injured the stomach ; in most cases the object was to increase the gastric energy and the nutrition, without considering that this was a fulness and a factitious strength communicated to the patient which concealed the alteration of the principal organs, and rendered their ultimate destruction more certain. In fact the irritability of the organs was misunderstood, and the remedies were applied to unmeaning denominations, while the mistakes committed, were such, as did not teach how to avoid mistakes hereafter.

This disgusting confusion turned away all the best talents from medicine, or rendered them empirics. But what good could be expected from empiricism, while the true notion of disease was so unsettled ? Empiricism pretends to find a remedy appropriate to the malady, without being at the trouble of explaining the malady, or how it is modified by the medicine. But what idea of disease could the medical knowledge of that day present ? If the explanation of the disease was rejected, what was it but a group of symptoms or a single symptom, such as inappetence or want of appetite ? But this was sometimes cured by water, sometimes by wine, by purging or by fasting, or by eating more in quantity, or of food more stimulating than usual. In such a case what was to be done ? What course was to be followed ? If you will not reason, or adopt some theory to

discover which of these methods you should resort to, nothing remains but to try the one after the other ; and if, unluckily, you should first pitch upon that remedy which does not suit the disease, you will increase the evil, and perhaps render it incurable. What I say here, concerning defect of appetite, is applicable to the greater part of other diseases ; so that physicians were unable to adopt the empirical method exclusively. They divided into two great classes ; the one credulous and superficial, gave themselves up to a theory, especially if it was fashionable in their own country, or that some eloquent professor had given it a value from the chair of an university. The other class, difficult to be convinced, either from the severity of their judgement or the natural vacillation of their intellect, throw themselves upon empiricism, or upon an eclectic system of the most dangerous kind ; and lamented, before men of science, the uncertainty and impotence of the art of healing. By dint of enquiry, and a desire to learn every thing relating to the animal Man, they seem to have arrived at doubt upon every thing.

It is easy to see, after this sketch, that medicine was not a science ; and that excitation, which they had taken so much pains to understand, had not yet become the base of any regular system, applicable at once to health, and to disease. Still there remained no other method of laying the foundation of a real science ; as every one will see, after we have stated the principal truths of physiological medicine.

CHAPTER III.

PRINCIPLES OF THE PHYSIOLOGICAL DOCTRINE.

This is based upon *Irritation*. We acknowledge with Brown that life is maintained by excitation alone. But we must soon abandon this author, for he takes the road of abstraction, and considers excitement insulated and in itself. Our object is, to consider it in the organs and tissues affected, or rather to consider those organs and tissues when excited. This study supplies a certain number of general truths, which we propose to state with illustrative examples.

Man cannot live but by means of that excitement or stimulation, (synonymous expressions) which the circumstances or media amid which he lives, exert upon him. These media are not confined in their action to his skin or his vision, they penetrate all the natural openings of the

body, which are themselves sensible organs, with extensive surfaces communicating with the skin. These surfaces which may be regarded as internal senses, occupy the interior of many viscera, and like the external senses, receive the stimulations or excitations of foreign bodies. These surfaces are membranous like the skin, but their structure is somewhat different. Such is the internal membrane of the larynx, which penetrates by the trachea and the bronchial vessels through all the pulmonary vessels; and the membrane of the pharynx which descends by the oesophagus and the stomach, and lines the whole intestinal canal to the anus. These surfaces are incessantly in contact with the foreign bodies; the first with the air and the particles it contains; the second with the air, the aliments, the beverage, and whatever can be introduced by the mouth or by the anus: of all this, the result is excitation.

This excitation takes place on the nervous matter distributed through and among these external surfaces, which we shall call *surfaces of relation*. This nervous matter being excited, transmits the excitation to the nervous system; and this last, either by means of single nerves, or by its cerebral center, reflects and distributes it through the web of all the tissues without excepting the surfaces of relation. These surfaces then, are placed between two agents of excitation; 1st, the foreign bodies with which they are in contact, and 2ndly, the influence of the brain. This last we call *Innervation*.*

This motion, a disturbance which takes place in the nervous system by being excited or stimulated, keeps up through life the movements which commenced in the fœtus, which is a diminutive mass of living matter. This mass cannot sustain its life but by the excitement produced in it by the nutriment conveyed to it. The embryo finds that nutriment in the fluids of uterus, which had been already subjected to the action of external modifiers. The fluids already animalized, are therefore the first excitements, in quality of being the first sources of nutriment—when the embryo organs become developed to a certain point, they re-

* It is a question at present whether electricity is not the cause of nervous excitation. It is not for us to discuss this question. Admit that the nerves are conductors of electricity or any other fluid or form of matter, the irritation of the organs remains a fact discernible by the senses; and being established as a fact, may be so taken in treating of the history of this science.

quired the external stimulants of nature. On being born, the nutritive fluids contained in the vessels of the infant, would be quickly exhausted, if not renewed, or else would lose their stimulating and nutritive properties. But the action of the heart, the action of the capillary tissues, and by consequence life itself, is kept up by the stimulation of the surfaces of relation—the stimulation that takes place in the nervous apparatus—the impression made by extraneous particles of various kinds absorbed—and by all these united excitations, added to those which are occasioned by the blood, and by the fluids already assimilated.

Here then are three orders of stimulating or exciting powers, viz. 1st, the bodies exterior to us, producing excitement which converges to the brain as a centre. 2dly, Inner-vation, or diverging excitement; being the action of the brain on the several tissues: 3dly, the stimulations which are produced by the motion of the fluids assimilated or not assimilated, in the midst of the solids; a general excitement which takes place in all directions. To these three classes of stimulation, we may add the action of the organs on each other, either by the intervention of the brain, or immediately by the nervous cords; a stimulation that takes place also in all directions. These comprise the *principle* stimulations of the animal economy.

But they are not all. The fluids in their connection with each other, and with the solids, are subjected to new combinations, changes of form, and perpetual transmutations. By the conversion of nutritious substances into fluids peculiar to the individual, the conversion of chyle into blood, of blood into various fluids, liquids into solids, and solids into liquids. But we may consider all the molecular movements founded on the affinities peculiar to living bodies, and which constitute what is called organic chemistry, as so many new excitations. In fact, to these is owing the disengagement of caloric; thus disengaged within the tissues it becomes a stimulant of the same kind as external caloric.

To these numerous causes of stimulation, all of them vital, are added the non vital stimulants, such as attraction and its modifications, electricity, inorganic chemistry, which often acts with foreign bodies upon the surface of relation. These powers tend to assimilate organic to inorganic bodies, and if they do not always succeed, it is because the laws of life react against them and neutralize their action.

This reaction itself is no other than an excitation.

It is under the continual influence of these numerous causes of excitation, that life maintains itself. So necessary are they, that if they are absent, death ensues. Much has been written in favor of vital power, the *vis conservatrix*. This power is no doubt calculated to excite our admiration, but we must not attribute too much to it. Man has been represented as an independent being, free in the midst of nature which he is destined to rule over. Will you judge accurately of this pretended independence? Nothing more is necessary to bring it very low, but the powers of nature of heroic activity, Poison, Fire, Volcanic explosion: remove him for a few minutes from the exciting influence of oxygen and caloric, then call upon him to exert that *vis conservatrix* which has been so much extolled in diseases of all descriptions. It assumed all the characters of a physical agent, but the want of power in this modifier has deprived it of them. Stop for a short time the operation of these stimulants; you have not broken the instruments of this vital energy, you have taken nothing from it; you have only diverted the course of this unknown but material principle; you have suspended it for a few moments, and already the man is a mass of inanimate matter. Let criticism then attack if it pleases, the fundamental principle of the physiological doctrine!

We have referred to excitation, the manifestation of all those phenomena which have been at all times considered as entering into the idea of life: to wit, the motion of fixed organic matter disposed in fibres, *contractility*; and as a consequence the motions of the fluids or moveable animal matter; also the consciousness of these movements, *sensibility*; whose modifications include all the intellectual operations. Upon these phenomena depend all the rest; as the production of animal heat, and nutrition, (or the substitution of animalized materials in lieu of other bodies) generation, &c.

As contractility is the principal instrument of the secondary phenomena of the animal economy, (for the primary are the molecular affinities) it is very important to settle the idea of contractility. In our treatise on physiology, we have defined it, a condensation, a shortening of the animal fibre: and we have stated that this was not confined to the muscular fibre, but was participated by all the forms of liv-

ing matter of which our bodily organs are composed ; and may be reduced to the following : *fibrine* ; *gelatine* ; and *albumen*. But as experiments and even engravings have been published to shew that muscular fibre experiences no shortening during its contraction, but a kind of zig-zag folding which produced no great diminution in its length, it seems proper, to save our readers some laborious research, that we should sum up those facts which induce us to make contractility a general property, and to view it in the light now presented. I would be understood however, as not supposing this explanation necessary to establish the physiological doctrine ; it is indeed superabundant ; and even if it should be true that muscular contraction produces no diminution in the length of the fibre, the basis of that doctrine would remain unshaken. But to the facts.

The muscles are the agents of motion : for this purpose they contract, and in contracting they are shortened ; our eye sight suffices to furnish evidence of this. If we could bring ourselves to doubt of this shortening in the muscles of men and of animals attached to a bone, it cannot be denied in worms and the whole of molluscous animals. In a word the muscles of every animal not furnished with a bony skeleton, shorten so manifestly during motion, that we must be deprived of eye-sight not to observe it.

It is equally evident in hot blooded as in cold blooded animals, as in the trunk of an elephant ; a simple folding could not produce the evident diminution of its length.—How can any one deny the shortening that takes place in the fibres of the muscular coat of the stomach, the intestines, the bladder, the matrix ? For it is manifest that their fibres are shorter when empty and when their sides are in contact, than when distended by foreign bodies within the cavity.

The shortening of the muscular fibre then, is certain ; nor can it be deemed hypothetical reasoning to lead off from this ascertained fact, in explanation of others ; on the contrary it is a mode of reasoning perfectly legitimate, to argue from what is known to what is unknown.

If we were tempted to attribute the contraction of the muscles generally to the nervous tissue, which is distributed through them in red blooded animals, (an error formerly adopted and which some may yet incline to adopt) it may be answered that the polypi and the other pulpy animals where this shortening is so manifest to the eye, have no

nervous apparatus. Moreover you may see the contractility exerted in fibrine separated from the blood, and in some of the plants cercaria. Shortening is therefore a property of the muscles and of fibrine generally. It is a property dependent on this form of organization in living matter : it is independent of the nerves. To deny these propositions is to deny proof positive, for no artificial experiment can invalidate the manifest facts of nature.

A multitude of agents may bring into play muscular contractility ; but the stimulations communicated by the nervous tissue produces them most efficaciously. This tissue has a center, the *Brain*, and a crowd of expanded fibres, differently formed, called *nerves*. The extremities of these expansions present themselves on the external or sensitive surfaces, and the organs of sense ; also on the internal sensitive surfaces forming the internal senses. Moreover, they are found in all the other organs, but neither so numerous or so developed. In all these places the nervous extremities receive stimulations ; these are conducted to the cerebral center, from whence they are reflected by other nerves, to the muscles ; the fibrine of these muscles shortens or becomes condensed, which is the same thing, and thus determines the motions necessary to the exercise of the functions.

Some physiologists think that what pervades the nerves and serves to excite the muscular fibre, is of the nature of electricity : others reject this explanation, allowing that electricity may follow the course of the nerves, without penetrating their substance. They admit therefore a particular fluid running along the fibrils of the nerves. What is certain, is, that if a current of electricity be passed along the principal nerve of a limb separated from the body, all the muscular fibres connected by nervous filaments with the principal nerve, are excited to contraction. But this fact does not bear upon the question before us.

The motions that take place by the shortening of the muscular fibre are those of locomotion which are prodigiously numerous ; those of the voice, of deglutition ; the progressive motion of the matters thrown into the digestive canal ; the greater part of those which are subservient to the exoneration of the body, all the voluntary motions, and to a certain extent all the involuntary ones which serve to express our wants, our passions, and some of our most lively sensations, all the motions which propel the circulating fluids, &c.

Here then is a prodigious quantity of movements executed by the fibrine of the body which forms the muscular fibre, and which depend entirely on its shortening or condensation. Is not this condensation brought about evidently by the stimulation of the nerves by different agents, which stimulation is by the nerves transmitted to the fibrine? The exaggeration or excess of all these movements, constitutes one kind of morbid excitation, a species of irritation. But even if no shortening of the fibre should take place, this excess will not be less real; it will have been produced by the same agents, calculable by the same means; and will not less constitute one of the grand classes of disease acknowledged by the physiological doctrine, as we shall soon see.

Let us now pass to another form of animal matter, *Gelatin*.

This constitutes the greater part of the tissues that are not muscular; it is found in all the organs intermixed with other forms of animal matter. Every where it exhibits contractility, which as in fibrine, is a shortening or condensation. The cellular and areolar tissue which serves to unite all parts of the body, and is the depositary of fat, is composed of gelatin. It is shortened when in marasmus it becomes emptied; it is condensed, and carries with it the skin, which becomes wrinkled in proportion as the subject is young and vigorous. It is sufficient to have dissected a dead body that is lean and one that is fat, to be satisfied that the cellular membrane returns upon itself in condensing, and when dilated, admits of a considerable extension. It brings back to their former situation not only the skin when it is separated from the other organs by corpulence, by serous effusions, &c. but also all the other serous membranes destined to facilitate the movement of the organs on each other, and which have changed their situation by tumours either normal or abnormal, (healthy or morbid) as alimentary repletions, pregnancy, serous collections, dropsies, inflammatory tumors, &c.

The fibrous tissue that serves as the base of the skin, is gelatinous (the skin itself is gelatin) and every one knows with what energy it contracts in fear, and several other passions, which produce that roughness called goose-skin, and which makes the hair stand erect, (horripilatio.)

The fibrous tissues of the cavernous parts of the body are formed of gelatin; and their contractility is so strong under the influence of cold, of anger, of fear, of shame, &c. that the penis appears to be drawn in and hardened. This re-

traction and hardening of the penis, is more observable in animals of the genus *Equus*. The vascular system is composed of gelatin, excepting the larger arteries, in which fibrine appears under a peculiar modification. Can any thing be more contractile than these sanguineous capillaries, which return upon themselves almost immediately after having been distended by the influx of fluids? than all those excretories which ejaculate their fluids, such as the salival capillaries, the lachymal, &c.? all the excretory ducts do not, like these, spirt out their fluids, but all of them have force enough to drive out their contents and conduct them toward the place of their destination. It cannot be said that this is not a shortening of their fibres; for it is so, to that degree, that most of these canals close of themselves, and become obliterated when they cease to act.

But are not we now speaking of that vascular apparatus destined to the purposes either of the blood, the lymph, or the secreted fluids which constitutes the greater part of the viscera? It will therefore be useless to dwell on the proof, that contractility, shortening, and condensation of substance, takes place in these organs, and determines the movement of the fluid columns that pass through them.

It is by nervous influence, innervation, that all these vascular movements are excited, sustained, and accumulated. Experience permits no doubt on this subject, since every thing which excites the nerves of a vascular apparatus, every thing which exalts its sensibility, calls to it the fluids in greater quantity, and determines either their accumulation or their rejection in more than the usual proportion, or their different transformations and combinations. Stimulation then, reaches the vascular fibres formed of gelatine essentially contractile, as it does the fibrine of the muscular fibre. It produces in them, in like manner, condensation followed by elongation and relaxation. The relations and the alternations of these two movements, explains all the displacements of the columns or masses of fluid which circulate in all directions across our organs. Why do they not say that the nerves are the sole agents in all these phenomena, and that the movement of condensation of a vein or a lymphatic which diminishes the caliber of the containing vessel to suit the size of the column of fluid, is a nervous phenomenon with which gelatin has nothing to do? This would be just as reasonable as to say that the muscular fibres are passive when the muscles contract!

Gelatin, moreover, forms ligaments, cartilages, and bones. This animal matter has not lost its contractility in these organs, for that property is essential to it; but its effects are something entrammelled by the crossing and decussations of the gelatinous fibres, and sometimes by their combination with inert matter, as phosphate of lime, which gives solidity to the bone. It is in this manner that Gelatin is prepared to answer the purpose of support to the organs, and determine the form and attitude of the animal.

We come now to the third form of animal matter *Albumen*. We had better study it in the brain, for it is there in considerable mass, and the eye can decide upon its motions. But the motion producing condensation is manifest beyond dispute, when the upper part of the scull is removed. After every pulsation of the heart, and after every inspiration, the brain is seen to retreat upon itself after having been raised up and enlarged. The condensation takes place in the direction of the white fibres, from the circumference to the centre, and to the base. Moreover, the serous membrane insinuated between the different folds and surfaces of the encephalic matter, admits beyond doubt, that an undulatory motion continually takes place among the fibres, and the encephalic mass is in continual agitation. A man who would doubt this fact, must be devoid of all talent for observation and induction. We have already stated, and we repeat, that these encephalic movements are antecedent to the serous surfaces of the encephalon, and ought to produce them; for two gelatinous surfaces in contact, and at rest, with no intervening motion, would adhere to each other.

Since motions of alternate contraction and relaxation take place in a mass of albuminous matter, it ought to exist in each fibre in particular; nor can we suppose them strangers to the influence of innervation. No doubt something else takes place in the interior of nervous tissues; but we cannot say how it is connected with these movements, or how it may contribute to innervation. Still, contractility remains as a vital property of the nerves; the envelopes of the encephalon, and the neurilema of the nerves, and the vascular system of the one and of the other, possess contractility as gelatinous tissues. The albuminous nervous fibre possesses this property as Albumen. It is by means of this important substance that we are connected with oxygen, with caloric, with electricity, and the other

imponderable forms of matter ; in fact, with that perpetual and unknown cause of life, of whose essence we are ignorant, and which in excess or defect for a moment, may destroy us. It is not permitted to us to explain the first acts of what we term life, because we cannot place under our inspection the phenomena that constitute us sensible beings ; nor can we place ourselves above that act by which we contemplate ourselves for the purpose of contemplating that act ; nor have the physiological physicians ever held out such a pretension. But every thing which results as a consequence of the first impulse—every thing which takes place in consequence of the movements of the means and instruments of this first impulse, this superior force, (that is to say, by means of the two other forms of animal matter, fibrine and gelatin,) are manifested by the phenomenon of contractility. But this is of immense extent, as we have proved ; for there is not a shudder that takes place in a muscular fibre—there is not an impulse given by a containing vessel—not a resistance by means of ligament, but what is referable to contractility. It is the unusual, unnatural exaggeration of these phenomena of contractility that constitutes irritation in the tissues spoken of. One may easily guess, therefore, how important it must be to know how to observe it well and accurately.

In fact, all the spontaneous acts of a man, whether instinctive or voluntary, whose assemblage insure the performance of the various functions, tend either to preserve him from the continually imminent causes of destruction, or to satisfy that feeling of curiosity which impels him to observe and compare himself with the things which are not himself. All these acts and their repetitions are the effects of excitement upon the animal fibre. We do not assert, however, that these acts are themselves excitement. We assert only that they manifest themselves to us as the results of excitement. Certainly the molecular combinations which alter the chemical properties of the aliments in the digestive canal ; those which take place in the bile, in the milk, in the urine, forms of animal matter, not found in the blood ; those which attach moveable and circulating matter to fixed and organized matter ; those which cause the embryo to germinate and to grow, &c. cannot be reduced to excitation, produced by foreign bodies. Indeed if the fibre be excitable, it must exist in that form which is fitted for excitation. If it do so

exist, it is in consequence of the laws of vital affinity which has arranged the molecules of which it is composed. The phenomena of composition then, are in the developement of each animal, anterior to the phenomena of excitation: these two phenomena therefore are not the same. This seems to be plain and simple reasoning: how it can be otherwise regarded we know not.

It is not our intention to discuss the first cause of the molecular affinities which organize a living body, but merely to give an idea of the phenomena that relate to excitation in man, considered in his perfect state of organization. We shall therefore proceed to the fundamental positions of the physiological doctrine by some developements on sensibility, and on the part taken by the nervous system in perception and motion. Thus we shall have treated the subject of vital properties, as much as is necessary to understand the phenomena of Irritation, the chief object of this first part of our work.

CHAPTER IV.—ON THE FUNCTIONS OF THE NERVOUS SYSTEM IN THE PHENOMENA TERMED INSTINCTIVE AND INTELLECTUAL.

In this chapter I shall examine in three successive sections:—1st. The functions of the nervous apparatus in the adult. 2dly. Their gradual developement from the embryo, till the man arrives at his full and perfect growth. 3dly. The reasons of the qualities which distinguish man from other animals.

Sec. 1st.—*Functions of the nervous apparatus in the adult.*

The duties of the nerves considered in this state of full developement, is to propagate stimulation in the animal economy, and to keep up all the functions by continuing them under the agents of excitation. This is proved by experience, independently of any and every system and explanation, as to the mode of receiving and propagating these stimulations. We know also, that the result perceptible to our senses is an augmentation of the phenomena of life, in those parts to which the stimulation is transmitted, as well as in those where it first took place. After these preliminaries, we may proceed at once to discover the functions of the nervous system, which we shall divide into four stages or degrees.

1st. Setting out from the most simple functions of the

nervous system, we observe that the stimulated nerves transmit those stimulations to a moderate distance. A thorn may be forced under the nail, without the person feeling it; nevertheless, the nervous matter which it stimulates, propagates the stimulation to parts in the neighborhood of the nerve, or to some nervous substance at a distance, until the fluids are insensibly attracted to the place, and a considerable congestion is formed at the time when it first becomes painful. The same circumstances take place in the viscera. Some foreign body, stopt at a place where the sensibility is obtuse, attracts to that place the fluids in the neighboring vessels, proving that the stimulation has been propagated; the vessels we know are accompanied by nerves. Let the same stimulation be located at some part of the mucous membrane of the thin portion of the intestines, and there will be an increase of motion, not only in the capillaries of that membrane, but also in a portion of the corresponding muscular fibres. Here then, are examples of stimulation propagated by the nerves to very short distance. We shall now state the like to greater distances.

2d. The stimulation which we placed in narrow limits in the digestive canal, has increased; it calls to that point the fluids in greater quantity; it is propagated to the liver, or the pancreas, and bile is poured out with the pancreatic juice. The mucous secretion becomes altered at greater distances; action is increased in the mesenteric glands. In a word, there is great disturbance in all the organic functions of the lower belly; that is, organic sympathies occur more considerable than in the former case, but without any sign of the stimulation being propagated beyond the visceral cavity.

3rd. Worms, which have a nervous apparatus without any well defined encephalon, and only with a central nerve more active than the rest, offer an example of this kind. Stimulation travels on by means of the nerves, which are not more numerous than the vessels, along the course of the vessels; it arrives at the point where these are terminated by capillaries, or proceeds along that tissue toward the great nerve, and regulates the nutritive processes. The great sympathetic nerve serves the purpose of all the functions of relation, which are very few in an animal destined to creep onward in a very simple progress. It possesses a vitality not quite so dull as some animals who have a nervous system

more developed ; but we see clear enough that the nerves of nutrition have more to do than those of relation. This degree will be a ladder to get at the succeeding.

4th. Figure to yourself in the abdomen, a shade of stimulation higher than that which we stated just now : it will be propagated to the heart, to the lungs, to the skin, to the members, to the different secretory vessels charged with the duty of depuration ; it will extend even to the brain ; for such is the human organization, that stimulation originating at one point of the body, cannot be propagated to a great number of organs, if it be not considerable enough to reach the brain. Here begins sensibility in the examples taken from men ; for here perception first takes place from the painful sensations of different degrees, felt and referred to the stimulated viscera, or to the members, or to other regions of the nervous apparatus, whether internal or external. Perception having discovered sensibility, we ought, if we would understand the phenomena, study the different kinds of nerves that meet at the encephalon to produce it ; and above all, the different states of the brain itself.

It is well known that, "to feel," can only be considered as a function of the brain ; but if this organ be healthy and perfectly developed, it will give us feelings or sensations, that differ according to the nerves that have transmitted to it the stimulation. Placed between two classes of nerves, one of which terminates in sensitive expansions at the surface, and the other plunges among the visceral tissues, the brain receives two kinds of stimulations very different from each other. If we next examine each of these two classes of nerves, we shall find secondary differences well worthy of attention ; and which prove that the brain has something else to do than to answer the stimulations of the senses vulgarly admitted by physiologists and metaphysicians. Each of our external senses is connected with a particular agent, which, being impressed, gives rise to a sensitive stimulation ; and all of them are susceptible of another kind of stimulation, when some body, calculated to inflict a wound, penetrates into the nervous matter of the organ of sense. (The impression of light on the retina, produces a sensitive stimulation : a body that lacerates the retina, produces a very different one.—*Trans.*)

The internal nerves also present notable differences. We find among them the genital senses, half external, half

internal, which are located either in the mucous surfaces, and communicating with several kinds of agents, or in the erectile tissues, which furnish a very distinct set of perceptions. In every internal mucous surface, we may distinguish a different sense. That which belongs to respiration, and which extends from the larynx to the bronchiæ, and which varies throughout its course, differs greatly from that which receives the food, and of which the internal coat of the stomach is the seat. The mucous membrane of the intestines, from the duodenum to the anus, possesses also a sense exhibiting marked differences from the former. So do the senses of the urinary passages, considered in their shallow cavity and their entrance ; while the sense of the urethra, excited sometimes by urine, and sometimes by the spermatic fluid in men, exhibits differences which multiply in proportion to the vitality of the internal membrane that lines the cavity.*

Besides the numerous internal senses in their regular and normal state, we must admit those which morbid causes produce ; for throughout the whole body, where irritation takes place, the nervous matter present in the tissues acquires a new activity, and gives rise continually to new perceptions. Hence the principal secretory organs, the liver, the pancreas, the testicles especially, the heart, the serous membranes that envelope and facilitate the movements of the principal viscera, the muscular tissue, the cellular, the ligaments, aponeuroses, cartilages, and even the bones, become in some chronic maladies, real internal senses, which transmit to the brain stimulations that rival in distinctness and intensity those of the regular senses so called. In a great number of cases also, where a man cannot positively be said to be diseased, many of our regular internal senses, those of the digestive organs especially, are so much exalted by irritation, that their action on the brain is tenfold what it is in a regular and normal state.

*The five senses, as they are called, seeing, hearing, tasting, touching, smelling, are distinguished because the sensations they originate are perceptibly different. The vulgar distinguish these, because the eye, the ear, the mouth, the nose, the fingers, are visible. But every source of a regular, permanent difference of sensation, is for like reason equally a sense. What can be more different than the wants that take their origin in the organs of respiration, and those of digestion, or generation ? Is the eye-sight more different from hearing, than hunger and thirst from the irritations of the excretory organs oppressed by ingesta ? Every tissue that in due and regular performance of its functions gives rise to sensations always different, is a different sense, physiologically.—*Transl.*

All the internal senses, moreover, of a normal and regular character, have a distinction analagous to our external senses. In fact, the brain placed between these two classes of sense, the external and internal, is so organized, that in all the external perceptions that relate to the satisfaction of instinctive wants, and which first develop themselves, it cannot determine the action, but by means of other simultaneous or consecutive perceptions which proceed from the internal senses. We shall explain this very soon.

Let us state, as a fundamental fact in this question, that the brain, or rather the whole encephalic mass, is so organized as to reciprocate with these different sources of stimulation; that it acquires its full perfection slowly and with difficulty; that this degree of perfection corresponds with the like property of the various sources of stimulation; and that it perishes more or less readily as these do. The following observations will explain this.

Sec. 2d.—*Successive developement of the different functions of the nervous apparatus, from the embryo to the adult state.*

In the first moment of his existence, man is no more than a diminutive mass of animal matter. He possesses no distinct organ. But the molecules of the mass arrange themselves according to the laws of an affinity which, we distinguish at a distance, so as to form successively the various animal tissues.

During all this effort of vital chemistry, (vital chrystalization.*—*Trans.*) the nerves and the encephalon have no occupation; they become developed, and that is all.

So soon as the tissues are formed, they act; each has its duty to perform; and the nervous commences upon its function, which is, to put stimulation in motion, and thus to determine the movements of all the other forms of animal matter. All subserving the regular transmission of nutritive matter to its destination, there to be subjected to the affinities of vital chemistry; for it can do nothing more important than press forward the developement of a human creature.

The nerves then, play the same part in the human embryo, that they perform in worms and other animals of a low class wherein we first observe them. In the embryo of a

* Chrystalization is the arrangement of molecules into some determinate form and shape, according to certain laws of attraction or affinity, equally unknown in the formation of rock chrystal or cubic pyrites, as in animal organization.—*Trans.*

few weeks old, there are as yet no members ; the brain and nerves, therefore, cannot preside over a heart and vascular system.

But the limbs, or members, begin to grow and push themselves forward like little appendages ; the functions of the encephalon augment in proportion as the body is developed, and its mass acquires more volume and energy. The stimulations that travel along the nerves and are reflected by the brain, can now determine the motions in the members of the fœtus. This is what the mother can tell us about the third or fourth month of her pregnancy.

Gestation advances: During the rest of its period, the internal senses destined to respiration, nutrition, and ejection of superfluous matter, are more elaborated than the rest, without excepting the external senses. The infant is born ; the cries it utters on the first impression of the air on its lungs, announce to us that it is now sensible, and that it probably has been so for some time before its birth, and that the movement of its limbs, while imprisoned, was the effect of some stimulation.

The functions of the nervous system and of its encephalic centre, become much augmented from the moment of conception. But we must not take for granted that they are more considerable than the actual observation and reasonable induction will warrant. A child born without a head, can neither perceive the want of respiration, or the contact of the atmosphere, although the sense of touch and the sense of respiration are developed and capable of receiving stimulations. The cries of an infant just born, arise then from a reaction in the encephalon, due to these first stimulations transmitted thither from the lungs. The skin and the bronchial vessels are also stimulated in the acephalous child ; but they run along the nerves in vain, there is no brain to collect and send them back to the respiratory muscles ; there is no perception or sensation.

The infant is now covered with clothing which preserves its temperature, and supplies as far as possible the medium from whence it emerged. The painful stimulation of the atmosphere ceases, the cries cease, and the infant is quiet, obeying one natural sense only, that of respiration. But this state of rest is not destined to continue ; another internal sense transmits its stimulations to the brain : this is digestion or the first assimilation (hunger.) So soon as this

has spoken, the infant recommences its cries. It is brought to the breast of the mother; immediately on contact it directs its face to her's, and all its motions to seize the breast and to work by suction and by swallowing are executed with precision.

This second want satisfied, the infant resumes his habitual calm, which the act of exoneration does not disturb, until the deposit of these matters on the linen, and irritation gradually produced by them on the skin, or some new demand on the stomach, or some extraordinary irritation again awakens him. Physiologists know that the alvine and urinary ejections do not take place but in concurrence with some action of the respiratory muscles. It is at least necessary that these muscles should follow the organs that return upon themselves for no vacuum could take place among viscera which touched each other. These respiratory muscles are under the control of the encephalon, which acts therefore in this case, in consequence of stimulations of the internal sense, belonging to the organs of evacuation, as well as of respiration; that is to say, without feeling pleasure or pain; but pain does accompany the internal gastric sense as well as too lively a stimulation of the skin. But if some obstacle should be felt either to respiration or defecation, the innervation of the bowels or of the urinary passages, or of the respiratory organs upon the brain, would increase and be felt with more or less vividness according as the encephalic development is more perfect.

These first perceptions are instinctive, as are the motions resulting from them. In the new born infant instinct reigns alone, but it is very limited. We shall see it increase as years increase. But as it may be confounded with intellect, we must seize the present occasion for distinguishing them. With the physiologist, it depends on the stimulations of the internal or external sensitive surfaces, propagated to the brain, and from thence reflected so as to produce muscular motion; which takes place either with pleasant or unpleasant perceptions, or without any perception which the observer can distinguish.

From this time then, we may distinguish two kinds of reaction in the brain, which receives stimulations from the nerves: 1st, reaction unaccompanied with pain or pleasure: 2ndly, reaction with one or other of these. All this, without any manifestation of intellect, and all possible to occur

in every animal possessed of a nervous apparatus. Taking care, therefore, not to suppose more than there actually is, let us pursue our historical developement of the nervous functions.

The infant grows, his limbs are formed. Two external senses, which as yet do not appear to have furnished any perception, begin to modify the encephalon which is now in a condition to respond. The infant fixes his eyes on objects, he follows their motions, and if you turn his back, he turns round his head to keep his eyes in the direction of the luminous rays which have escaped him : it is an instinct more perfect that induces him to execute this motion. Moreover he is attentive to noise ; that is, by a like instinct he moves farther off, or he approaches as well as he can, or keeps his body motionless to perceive the impression of the human voice, or the sound of instruments, &c. These are two new senses brought into action, and the child that had before only touch and taste, has now eye sight and hearing.

That acquisition does not seem immediately to produce any new action : but now it is observed that when his immediate wants are satisfied he no more falls into a sleep, he begins to observe himself, and aided by the signs of his nurse he marks the inconvenience of uncleanness, and learns to get rid of it. His smiles of pleasure accompany the satisfaction of his wants, and the caresses of his nurse. He puts himself now in relation with the beings of his own kind. He seeks to handle the bodies which he sees, and tries to imitate the sounds he has heard. A new want has now arisen, curiosity. The desire of moving, necessarily accompanies this. The infant exerts his muscles of locomotion not only to bring objects within his reach, but to approach them, although this is done very often ineffectually. He is determined to this by an internal impulse purely instinctive, even when he has no object in view, no end to serve, he bestirs, he agitates himself, he is never at rest unless while sleeping, or while some new object rivets his attention and gives it a new direction.

But let us stop a little at this power of calling off the attention from a sensation. It did not exist before. Here then is a new faculty in the brain which has been developed with the senses of hearing and seeing. No doubt it is so ; and this new faculty is nothing more than a greater developement of instinct, dependant on the augmentation of the

encephalon, which is not merely enlarged, but begins to be well marked out in regions where it was heretofore but roughly sketched. These regions are the different points of the anterior portion which corresponds to the frontal bone.

In proportion as this part of the brain becomes more distinct, the expression of the physiognomy is heightened ; the eyes and even the motions of the muscles of the face, and the complexion, announce that the child has ideas analogous to some of our own. For expression is not a being—an entity taking its station in the face, but it is property belonging to this part of the body, of making known to an observer that the person observed possesses ideas. The most expressive physiognomies, disclose nothing to persons of weak minds.

Here then are the first lineaments of intelligence, which henceforward are marked. We should have looked for them in vain in the young child who furnished so many proofs of sensibility ; I beg the reader not to lose sight of this, and he will see that sensibility, intelligence, and instinct, are very different things. In fact, the action of the nerves on the motions of the heart and vascular system, with which they are developed, constitutes the *first degree* of nervous action : the *second* is manifested when the brain, stimulated either by the internal senses, or by the limbs when they are bent, pressing upon some of the viscera, and in some manner which we may suppose unfavourable to the regular progress of the animal economy, produce motions in the locomotive muscles of the child in the womb. The infant just born, gives evident proofs of sensibility, but only by the expression of pain ; and executes also some instinctive actions : this is the *third degree* of nervous action. Lastly, the *fourth* to which we now come, seems to be prepared by the development of agreeable sensations, never perceived until now : this is the period when intelligence shows itself, by giving birth to attention, by acts of observation, and by the faculty which the infant henceforward possesses to put off action solicited by instinct, and of the first necessity, to execute others enforced by external impressions.

Still this intelligence is as yet, extremely limited ; and it would be a great mistake to consider it as equal to that of the grown up man. The infant as yet, has no ideas but of material bodies ; nothing proves that he is able to analyse and abstract their attributes. He seems much more advan-

ced with respect to the perceptions that human beings like himself, furnish to him ; for long before he is able by his gestures to exhibit his intelligence upon colors, solidity, and the motion of inert bodies, he distinguishes very plainly kindness, bad temper, or anger, in the physiognomy of the persons who approach him. Frequently he cannot bear without painful feelings and tears, and turning aside his face, the sight of grown up persons unknown to him : especially if they have a physiognomy somewhat harsh ; while a good tempered, or insignificant face, or the sight of an infant like himself, produces no unpleasant feeling.

The cause of this is evidently, that the developement of instinct goes on faster than that of intellect : an unpleasant physiognomy frightens him, as a result of the instinct of self preservation ; just as he would be frightened if one were to threaten to throw him down a precipice, or at the sight of a furious animal, ready to rush upon him. He feels sensations, such as those of hunger and thirst, the want of rest and motion, heat and cold, and he obeys them without hesitation : but the inclination to observe, and curiosity always increasing, soon render him educateable, and show that he may be accustomed to support without fear, the sight of all those objects which gave him at first so much uneasiness.

In the mean time, the infant makes progress ; he imitates the accents of the human voice, and even all the actions of his fellow creatures : he does more, he shows that he has not only ideas of the properties of bodies, but also of the circumstances under which he observes them. When he lives with well educated people, he remembers the words, by which they express their opinions of the different scenes of social life, and he employs them so as to show that he understands them. We should be tempted then to believe that his intelligence was perfect ; but how far is it yet from its final developement ! to prove this, induce him if you can by means of the words which he understands so well, to enter into some accurate process of reasoning ; and you will soon see that his attention becomes distracted from the train of ideas that you would impose upon him, and he fixes upon some other ideas, more simple, which his memory substitutes, or on impressions which have been made upon his senses. This depends upon instinct making more progress than intellect : the brain of a child, not yet arrived at the age of puberty, is so organized, that he receives no lively

pleasure, unless from the impressions of material objects ; these alone, agitate agreeably his nervous system. To eat and to drink, to take much exercise, to see new objects, and satisfy a wandering curiosity ; to put his limbs in action, which nature orders him to do ; to try his strength, and to compare it with that of others, not only for the purpose of exercising it, but to obey the want of that self satisfaction which shows itself but as yet only in outward actions, such are the customs imperiously demanded by instinct ; and to which, youth, not yet arrived at the age of puberty, always returns, whatever pains you may take to turn him from them. The pleasures of reflection are as yet unknown to him, excepting those which he obtains by stratagem, which he substitutes to strength, whenever he wishes to act upon one stronger than himself. This kind of pleasure has more attraction for him than that of kind actions ; unless indeed, he finds in these, the means of exercising his predominant faculties ; this would be the case for example, in protecting a young person weaker than himself, whom he would plague the instant after. In general, he prefers mischief to doing good, because by this means he satisfies his vanity, and he finds in it more excitement, which is necessary to him, at whatever price. This is the reason that we see him so often amuse himself by breaking to pieces inanimate objects : and he finds a double pleasure, founded on the desire of self satisfaction, to find resistance yield to him, and to excite the anger of reasonable persons ; this seems to him a victory that he enjoys deliciously whenever he can escape by flight from merited punishment. On the same principle of action, he delights in torturing animals ; and he would enjoy the same pleasure in torturing individuals of his own species, if he were not restrained by fear ; for the desire of self preservation is very strongly marked in him. Compassion does sometimes restrain him ; but this is a feeling not much developed at this age in the male sex : we find it more frequently, and more distinctly marked in young girls. I know that all the acts of young people before the age of puberty, are not distinguished by this depravity : the character of goodness which marks many persons afterward, begins to appear before the epoch of reason ; but the great majority are such as I have described ; and the more vigorous young boys are, and the more lively do they feel the want of expending their force by external motion, the

stronger is their tendency to do wrong : there is scarcely a child that does not make a bad use of his strength upon others who are weaker than himself ; this is his first movement ; but the cries of his victim stop him, when he is not naturally ferocious, until a new instinctive impulse induces him to commit the same fault.

To correct these propensities, which reason, and experience of the unhappy consequences attending them, would never correct, or correct too late, two methods have been adopted. The instinct of self preservation is brought into play by the punishments which terrify the child, and turn against him the consequences of his bad actions : endeavors also are used to turn him aside from selfish gratification in these pernicious indulgences, to render him more susceptible of those pleasures which attend praises obtained by docility, kindness, goodness, attention to his duties, effects of study, memory, and intelligence.

This last faculty is put in requisition by anticipation, in explaining the notion, of good and evil, justice and injustice, merit and demerit. These are most useful ideas, which are as yet confused in a child of that age, and applicable at will to his petty passions, but which are rectified by being presented accurately drawn out by the labors of philosophers and sages. We succeed in this task in proportion only to the developement of those parts of the brain that belong to intellect.

While we exhaust our unproductive efforts to hasten the developement of intelligence in the child, and inspire him with a taste for serious objects, a new function establishes itself, and nature performs without effort, what art would have attempted in vain. The organs destined for the production of the species become developed, and the encephalon receives an impulse which is calculated to carry it to its last degree of growth and energy. The young man perceives a prodigious change in his manner of seeing things. So soon as he has received the influence of this new sense, a wandering kind of inquietude seizes him ; the eyes of the other sex excite within him instinctive movements that he feels with surprise. If we examine the state of his intellect, we shall find that he has discovered new ideas in words that he thought he well understood, but had never suspected before ; he sees relations, bearings and order, where he before observed only differences, multiplicity, and confusion. Ideas

of connection and casuality arise ; he loves now to draw inferences which are as easy as they were formerly difficult, and he becomes suddenly a maker of objections and a reasoner. He begins to find pleasure in reflecting on himself, in observing what he does and what he thinks : he is inclined to compare himself with others in respect of these new faculties which he feels an interest in studying as they appear in others ; and if he finds he has any advantage, he is much more flattered than by any superiority of strength or address, although he is still more flattered by the latter quality, than he will be by-and-bye. This is a wonderful revolution, which would have been quite impossible to all the common places of wisdom.

The new facility which the youth feels he possesses for all the operations of intellect, seldom fail to lead him astray. He seems to think he invents, he creates what he discovers ; it seems to him that thought goes on quicker in him than in men in general ; he sees with a kind of disdain the intellectual slowness and circumspection of riper age. He does not perceive that he is only working upon that multitude of ideas, which, during his long childhood, were inculcated with so much pains ; he has not yet had time to feel that opposition, and experience alone can give him any just notion of the inconvenience of hasty conclusions, and of that facility which seems calculated to overcome all obstacles.

As muscular force and the feelings of life and health have augmented as well as his intellectual faculties, the young man sees before him an immense prospect ; and the generative power with which he feels himself abundantly supplied, adds to his arrogance by multiplying his intellectual enjoyments.

Such is man in the spring-tide of life. 'The nervous system executes from henceforward all the functions which belong to it : but the intellectual faculties do not acquire their full vigor till about the age of thirty ; an epoch when the increase in growth has developed the whole brain in every direction to which its fibres can extend. During the space of time which separates the appearance of the last of the intellectual faculties from the full developement of the whole intellect, the judgement goes on toward perfection. The man having been often deceived by hasty conclusions from first impressions, that is, having been repeatedly com-

pelled by the acquisition of new ideas, to correct his first opinions, becomes gradually sensible of this kind of humiliation. The first time he commits these kind of errors, he hastens to correct them without feeling any thing but pleasure at having learnt some thing new ; but when he sees the necessity of correction multiply continually, his self-love becomes alarmed, he becomes angry, and employs cunning to maintain the authority of his first conclusions : but internally and privately, he determines to endeavor to spare himself humiliation or anger, and becomes, as we say, circumspect.

It is now that his faculties, if they have been properly cultivated, are carried to their highest perfection. Man is so favored by nature, that he can enjoy them for a long time, and procure an amount of happiness, of which other animals seem to have no idea.

Let us see now to what is it owing that he enjoys all these advantages.

Sec. 3. *Reason of the prerogatives that distinguish man from all other animals.*

We have left the youth in connection with every material object, animate and inanimate, distinguishing of his own accord, all their external attributes, and able to discover the most difficult of their physical properties, even to the circumstances that may modify them ; but it is only when he is called upon to observe them, that he remembers wonderfully all the signs of his intellectual operations, and acquires in consequence, ideas of abstraction. But we have noticed that he exhibits great repugnance to make an application of these precious signs, to the investigation of those circumstances which produce a variation in the state of bodies, and to the comparison of his own intellect, with that of his equals : that is to say, he dislikes to abandon himself to reasoning and reflection. In other words, we have seen that he learnt easily, not only words, but the formula of ratiocination—that he seemed to understand them, but exhibited no propensity to make others like them, although placed in favorable circumstances ; and that an insurmountable force brought back his attention to some order of ideas far less complicated. We have remarked, that at the same time when he acquired the faculty of reflection and of reasoning, a new sense manifested itself, with a new instinctive want. So that there is always the same law of the developement of man : if he acquires an in-

crease of intellectual power, and an increase at the same time of instinctive faculties. But nature seems to have associated the perfection of intelligence with the generative faculty; so that the young man shall not become transformed into the father of a family, before he has acquired the strength and intelligence necessary to provide for all the wants of his offspring. The exceptions of this rule, though rare, sufficiently demonstrate its great importance. We see among male children instances of premature puberty at five or seven years, for instance, which are accompanied with the usual grade of intellect of that time of life; a disgusting and deplorable spectacle. It is by investigating these kinds of subjects, that we can obtain a solution of the question that occupies us. Let them be well examined, and it will be found, as Dr. Gall has well remarked, that the cerebellum is more than usually developed, while the anterior part of the brain, the seat of intelligence, which is always at its full size at the full period of regular puberty, is not larger than what belongs to a mere infant. Dr. Gall concludes that the cerebellum is the special presiding organ of generation; but if we consider, 1st. That the heart, the sanguineous system, the respiratory muscles, those that depend on the will, take their last growth with the cerebellum, as well as the organs of generation; 2dly. That if the testicles are taken away before puberty, the developement of all those organs, as well as of the cerebellum, is deficient; 3dly. That castration, after the age of puberty, diminishes not merely the cerebellum, but all the muscular apparatus, and the sanguineous system—we shall be compelled to allow, 1st. That the cerebellum is not alone appointed to the use of the instinct of propagation, but it is equally connected with that increase of vital energy that produces the full developement of all the organs; 2dly. That it is not the sole promoter of these changes; 3dly. That the simultaneous developement of the cerebellum, the sanguineous system, and the external muscles, after that of the testicles or ovaries, is the only constant fact; but, that usually the brain receives, at the same time, its last impulse of growth on which the intellectual faculties depend, more especially those of reflection and induction. This suffices to answer the question before proposed.

Sec. 4. *On what depend, the final developement of the intellectual and instinctive faculties, which accompany the evolution of puberty.*

It seems that the developement of the testicles and ovaries, is brought on by the common process of nutrition, which always causes the most important organs of existence in the individual to precede those that are less so ; that these organs begin to grow and secrete without any preparatory shock ; and that they excite throughout the viscera, whether by the influence of the nerves distributed through the organs, or by the re-absorption of the liquor they elaborate, an excess of vitality which pushes on the whole body toward its last degree of developement. This was *nearly* the common opinion, prior to the system of Dr. Gall, who referred all these charges to the cerebellum. But why should we impute to it those changes which the cerebellum alone cannot produce ? Why does it not grow ? Why not determine the forms of puberty among eunuchs, always excepting that which relates to the generative act ? Why does it not preserve these forms among youths at puberty, whom we submit to castration ? How happens it that it is itself oppressed after this operation, in common with all the muscular system ? Will it be said that this cerebellum makes use of the genital organs as an instrument to react on the animal economy ? This will admit the influence so long acknowledged, of the testicles on the sanguiferous system, the muscles, and even on the brain. It is easier then to take the facts as they are, and acknowledge that since the cerebellum is incapable of producing changes in the form, in the voice, the color, the muscular force, the character, the inclinations that characterize puberty—these changes are results of the developement of that part of the genital apparatus, destined to furnish the first materials of the embryo ; that the cerebellum is thence affected like every other part of the encephalon, but that its developement is more particularly connected with the internal functions which preside over nutrition, and produce the abundance and energy of the fibre.*

We see that the intellectual, like the instinctive faculties, are developed along with the nervous system ; that they result from the insensible ampliation or growth that takes place in the encephalon and the distributed nervous system, during the period from the embryo to the adult state ; that they are in fact, to the physiological observer, nothing more

*I doubt whether these considerations are quite sufficient to set aside Gall's facts.—*Transl.*

than the transmission of nervous encephalic stimulation, considered under peculiar circumstances. The catenation of the facts which we have unfolded, proves this; but to add to this proof, we shall present the following considerations drawn from the same source, a rigorous observation of facts.

1. The quantity of innervation afforded by the instinctive and intellectual phenomena, being of a higher character, and connected also with that which causes muscular motion, is in its degree necessarily a disturber; it would soon terminate our existence, if it were not interrupted at the end of a certain time: hence the necessity of sleep, which substitutes another form of innervation for that of wakefulness. Sleep, when perfect, suspends these two kinds of phenomena, although it cannot prevent some of the stronger stimulations of the nerves from reaching the brain, and being from thence reflected on other nerves. What proves this, is, that the muscular surfaces of the hollow organs, and the respiratory muscles, which cannot act regularly, but by means of the brain, continue their motions, while no instinctive act is manifest, and no thought troubles the repose of sleep.

Dreams do not take place but in imperfect sleep, or at the beginning and the end of usual sleep. But if you awaken suddenly a profound sleeper somewhat fatigued, in the midst of his first sleep, he will tell you he had no dream. Dreams and somnambulism come in aid of our assertion, for they present a feeble kind of rest wherein many stimulations reach the brain, and determine that series of thoughts and acts which always show an incomplete and irregular state of encephalic innervation. Sometimes the regular instinct brings in subjection the intellect to which it was subordinate during wakefulness; sometimes an irregular intellect provokes instinctive motions which would not otherwise have taken place, &c. but this innervation is always less considerable than what takes place in a state of wakefulness. The fœtus seems to pass through these different shades of innervation. During the first months its sleep is perfect; during the latter months it is often interrupted by perceptions which cannot bring into play any thing but instinct in its most limited phenomena relating to the preservation of the individual; nor do they shew themselves, except by momentary motions produced by pain. These motions are

in fact the first and most simple actions of that class of animals which are provided with a sensitive apparatus. So similar are they, that they differ only from those of the polypus, by their proceeding from a stimulation reflected by an encephalic apparatus. Is it not evident that the first motions of an embryo are those of zoophytes, and as the embryo grows, they put on the character of sleepy motions ?

2. Diseases augment, diminish, interrupt, deprave the encephalic innervation in all its relations, instinctive, intellectual, sensitive, and muscular. In many soporific states not profound, as in coma, lethargy, incomplete apoplexy, there is a perfect interruption of intellectual innervation, with continuance to a certain point of instinctive innervation, manifested by the motions of co-ordinate muscles. The patient turns aside to avoid noise, light, palpitation, &c. In epilepsy and hysteria, instinct reacts also but irregularly and by convulsions. In strong apoplexy, intellect and instinct are both banished ; but the motions of the heart, and those of the splanchnic muscular fibres exist co-ordinately (by means of the encephalon) with those of the respiratory muscles. In complete syncope, as well as in asphyxy, the innervation of the brain is diminished to such a degree, that the respiratory motions, and those of the heart, become insensible.

Here then, the functions of the encephalon and the nerves, have been analysed by their diminution through all their stages of decrease ; and the adult appears retrograding as far back as the embryo. In insanity, on the contrary, we find these functions analysed by their exaltation, not only according to their degrees, but their differences, as we shall see in the second part of this work ; until excess of irritation deprives man of his first and most simple motives of action, instinct, and will, and reduces him in point of innervation to the state of the embryo, whose limbs are not yet developed. This is what we are accustomed to observe in those kinds of insanity which degenerate into complete fatuity : the man in this case, stript of all motive to external action, remains motionless ; exhibiting neither appetite nor desires ; feeling no want, he would permit himself to die of hunger, and remain motionless in his excretions, if his fellow men did not take pity on his condition. Life remains, however, so long as food is introduced into his stomach by the aid of strangers, while the gastric passages can assimilate

it, and the interior innervations can distribute it through the animal economy, and offer to the several tissues the assimilated fluids proper for their nutrition.

It is true then, that the business of the nervous system, is to transmit the stimulations of one part of the animal economy to another ; and in performing this duty, five classes of phenomena appear in the early period of existence. 1st. The oscillatory movements of the heart and vascular system. 2nd. The contractile motions of the visceral, muscular fibres. 3rd. The motions of the respiratory muscles, always co-ordinate with these last, and attesting the intervention of the encephalon. 4th. The motions of these muscles, and those of the voice, and of locomotion ; in an order, and for a purpose which we may easily distinguish, but without any intellectual operation : a phenomenon purely instinctive, which is itself no more than the expression of our first wants, arising from the stimulations of the nervous apparatus of the encephalon. 5th. And finally, the same motions under the directions of intelligence, which sometimes make them co-ordinate with instinctive suggestions, and sometimes with desires that take their rise from curiosity.

We see that this last want (curiosity, or the feeling of the want of observation) comes in as an addition to all the others : it shows itself at first, as an instrument to satisfy these other wants by an instinctive impulse, in proportion as the mother ceases to provide for them ; and it finishes when the brain is perfected, by giving birth to all the intellectual operations which supercede the mother and instinctive motions. These operations, derived from one source, (curiosity,) seem to multiply themselves in proportion as the man abandons himself to the impulses of this same want. It is also evident, that the high degree of perfection of those acts which are suggested by the desire of observation, (curiosity,) is that, in which intelligence is reflected with most energy upon itself, exciting to the study of itself, and to cause itself to be studied by other men ; for it is incontestible, as some philosophers have truly said, that the more a man reflects for the pleasure of reflecting, the more desirous he is to communicate his ideas : very different in this respect from one who seeks to satisfy wants of a lower order ; who, if he be prudent, is secret, and communicates to others, those only of his ideas which may aid in the execution of his purpose.

CHAPTER V.—ON THE THEORIES ADVANCED CONCERNING
THE INTELLECTUAL PHENOMENA.

Having followed man during his growth, and having laid down the inappreciable advantages he derives from the gradual advance to perfection of his encephalic apparatus, we are now led to consider the explanation he himself gives of these advantages. Here, men are divided into two classes: to wit, those who speak of intellectual faculties without being acquainted with their organs—and those who speak of them possessing that knowledge. The first class know nothing of Irritation; they must be led to it: for independently of the first cause, and the profound respect due to it, we are compelled by the undeniable evidence of a thousand facts accurately observed, to refer all the instinctive and intellectual phenomena, to the action of the nervous apparatus; and to explain their lesions by the changes which take place in its excitation; changes where we see in the first rank, the phenomena of irritation. To arrive at the demonstration of this truth, we shall examine in the seven sections following. 1. How man came to abstract himself from himself, and the foundations of the psychological doctrines. 2. What idea they annex to consciousness, and whether other animals are endowed with it. 3. Whether it be possible to form a science of the phenomena of consciousness alone, as the psychologists pretend: and here we shall expose the sources of their errors in explaining internal perceptions. 4. How it is that consciousness and the senses aid each other in constructing a true science of man as a feeling and thinking being: with an essay on the personified principle which the psychologists would impose on the nervous system. 5. Whether the explanation of the physiologists on the ascertainable cause of the intellectual phenomena, is an hypothesis like the principle of the psychologists; and we shall shew the connections which unite the internal functions, to those of the organs of external relation. 6. To what it is that on the ultimate analysis, all the objections are reduced which are urged against the office of the nervous apparatus in the production of intellectual phenomena. 7. What we are to think of those philosophers who call themselves rationalists, theologians, illuminated, mystic.

Sec. 1. How man abstracts himself from himself: basis of the psychological doctrine.

In seeking to satisfy his first wants, man enters into the field of observation: the remarks he makes serve only for

that purpose. By and by the observations of bodies which he is compelled to examine, becomes of itself a pleasure, which often leads him aside and makes him forget the objects of his researches. At length this new pleasure takes such hold upon him, that he forgets his original object, and begins to think that he is placed in this world only to contemplate nature and observe himself; and this becomes to him the most noble and most essential of his occupations. He goes further: he frames an hypothesis: he divides himself into two beings, of which, one which he confesses he has in common with other animals is the object of his contempt, while the other, which has nothing in common with blood, flesh, or even the nervous system, rules over the first, and constitutes more especially, the being *Man*. Here follows the mode of proceeding he adopts to arrive at these ontological assertions.

He takes all the phenomena of intellectual innervation, more or less mixed up with the instinctive, and applies to them a word; which word becomes the mover of the phenomena themselves. He is manifestly led to this erroneous distinction, by his ignorance of the manner in which the phenomena are actually produced: this it imports us much to search to the bottom, partly for the purpose of determining truly the functions of the nervous system, and partly to enable us to comprehend the theory of Insanity, which will engage our attention in the second part of this work.

Judging of himself by bodies of a lower class, and by the circumstances in which they are placed, man imagines that his intellectual phenomena are directed by an intelligent being placed within his brain; like the tunes of an organ produced by some musician out of sight. He does not sufficiently reflect, that there can be no comparison between a human being playing on an instrument, and the cause of intellectual phenomena which take place in that same human being. He persists nevertheless; he converts the observation of these phenomena into a science; and he calls it *Metaphysics*.

The anatomist however, comes forward, armed with his scalpel; he dissects the dead man; he make experiments on some living animal; he compares it with man in a healthy, and with man in a diseased state; he does this in spite of the metaphysician who thinks himself dishonoured by such a comparison. The anatomist now shews, that the pretend-

ed organist which the metaphysician had located in the pineal gland, or the pons varolii, is nothing else than the whole connected encephalic apparatus. Some reasoners seize upon this discovery, and endeavour to show to the metaphysician, the impossibility of forcing into contact, something which has none of the properties acknowledged to belong to the body, with the nervous matter of the encephalon which is a part of the body. This difficulty does not stop the metaphysician: his imagination produces some inter-medial entity, some air, or gas, or subtle matter to bring about this singular connection of a being, that has no property in common with matter, and the material substance of the encephalon. It is urged, that let him do what he will, his intermediary substance will always be material, and no reasonable person can bring himself to admit the existence of a substance, which is not cognizable by any sense he possesses.

The metaphysician remains unconvinced. He has never been at the trouble of examining the functions of the nervous system, so as to be capable of conviction: he hesitates however. His uncertainty, his concealments, the weakness of his arguments, destroy his credit with men of science; and the opinion begins now to prevail, that as there can be no real science, except of facts that are certain, and of things which the senses can take cognizance of, it becomes necessary to bring back metaphysics to objects of sense; but this destroys metaphysics as a science, and reduces it to physiological facts, and conclusions of the same kind as those which we have already propounded.

The science of Man was at this stage, when the metaphysicians who were expected to yield with a good grace to the class of observers who took their senses as guides to their researches, rallied, and now placed their ontologic philosophy on the basis of what they called *facts of consciousness*.

It is on the inspiration of consciousness then, that modern metaphysicians, discarding that title as savouring too much of theology, hold the following language as *Psychologists*. "No doubt the sciences ought to repose on facts capable of being observed; but it is not strictly true that these facts must be observable by the senses. Here are two kinds of observation independent of each other: one proper to naturalists, the other to philosophers: the first admits the evidence of the senses alone; the other is founded on internal

evidence, and the facts thus discovered are facts of consciousness. They fall not under cognizance of the senses : nevertheless they are facts, and facts of the utmost certainty. What can be more sure than to feel pleasure or pain, to feel ones own existence, to feel that we think or that we have thought of any thing ; that we will, or that we have willed any thing ; that we believe one thing, or doubt about another, &c. But since these two classes of facts are equally certain to the human being, the history of man is two fold. It is in vain that the naturalists would base it on facts cognizable by the senses alone, and the philosophers on facts of consciousness ; the two classes cannot be confounded. Consciousness feels itself, but does not feel the sensations : the senses perceive nothing but external objects and impressions, and can neither see, or hear, or touch what is evident to consciousness. Senses and consciousness have nothing in common, except to be equally in connection with the intelligent principle, which is individual in its nature, and to which the others administer. If we have not yet succeeded in reducing philosophy to a science of certainty, it is because its truths have not been understood. Hitherto the two classes of facts have been confounded, as have the two corresponding sciences. The naturalists have gone astray in treating the facts of consciousness as sensible facts : the philosopher has been equally mistaken in admitting this method, and affecting to refer to his consciousness, to decide on sensible facts. Neither of these sciences ought to borrow from, or concede any thing to the other : it is high time that each should know his proper boundaries : and if the physiologist or the naturalist will absolutely treat on the moral character of man, they must abandon all investigations that depend on the senses, throw away their scalpels and microscopes, and like the philosophers, give themselves up to meditation in the absence of all outward impressions, and become solely psychologists.”

Thus spake the metaphysicians of the new school : and the ideologists who were enrolled under the banners of Locke and Cordillac, by referring all our ideas to the impressions made upon our senses, now found themselves embarrassed. They had not foreseen this important objection ; and so soon as the psychologists advanced under cover of consciousness, the existence of a mover independent of all animal substance—while they protested that they

felt the existence and operation of this mover—that they saw it act freely and originally without any other relation to the external senses than that of a master over his servants—the ideologists were afraid to contradict it openly. But when the psychologists came forward, and in the name of their Sybill pronounced anathemas against all those who doubted of these truths—when they expressed a contempt for all those whose intellects were so gross as to refuse their assent to the evidence of a principle superior in wisdom and elevation to bodily senses composed of matter, vile, and subject even to putrefaction—the ideologists who had admitted this simple principle without doubting but they could amalgamate it with their own theory, remained unable to reply; with one only exception.* We are now at this point; the Ideologists are silent; or advance no refutation; and the physicians who cultivated physiology reclaim for themselves by halfway complaints, the science of intellect which has been ravished from them, and appropriated to themselves by the psychologists, who had never condescended to study the organs or the functions of the bodily system. As it is solely on the evidence of *consciousness* that the psychologists rely, I proceed to examine what they understand by that word; and whether it be possible to erect a real science on this word alone as the basis of it.

Sec. 2. *Of the notions entertained by the psychologists of consciousness: are animals endowed with it?*

By consciousness they understand that faculty which man possesses, of observing himself: not of observing external bodies which he cannot do but by means of the senses; but of observing his thoughts; that he thinks of this or that; that he wills or that he does not will; or that he does or does not will this or that. This is what I have denominated in my treatise on physiology by the expression *to reflect upon one's self*. This has no termination; for in observing, I feel, I perceive, I am sensible that I observe; and so on. This kind of intercranial innervation, distinguishes us among animals, and places us at the head of them, by the perfection to which it can be carried in our species. We cannot admit its existence in any living being unless he can make us understand that he possesses it, either by his actions or his discourse. As the fœtus, the embryo, the new

*I believe he alludes to Destut Tracy, the friend of Cabanis; the author of the Ideology.—*Transl.*

born infant, and all the animals of a *lower class*, exhibit no proof of possessing it—as they have no language, and therefore cannot say to us, “I feel that I feel;” nor can they understand us when we employ this formula—we therefore do not hesitate to decide that they do not possess the faculty which it expresses. In observing the infant and the progress of his growth, we seize upon that moment when he deliberates between several impressions; it is from that moment we may conclude that *he feels that he feels, and that he has felt*, that is to say, the phenomena of consciousness then manifest themselves in him.

If on the other hand we apply our observation to many other animals, we observe the same phenomena. In truth, we see that animals do not confound themselves with any other body in nature : they receive many impressions : they hesitate before they act : and they act without any proof to us that they are determined, except by some one of their actual and present impressions. The case is the same when they obey the impulse of a simple recollection ; that is, they feel at present, that they have felt heretofore impressions different from what they feel at the present moment by means of their senses. For instance, a well-educated hunting dog, who formerly devoured the game, now brings it without hesitation to his master ; he seems even to applaud himself for not having given way to his appetite. Such is another dog, who although tempted by caresses, and by food set before him, refuses to stay with the person tempting him, and returns to a great distance to rejoin his master whom he has not seen for some days, &c. Such are wolves, wild dogs, and animals of prey, who though pressed by hunger, but foreseeing from the presence of the enemy that there is not time to satisfy their hunger with security, hide in some place the animal they have seized, after taking the precaution of killing it, and then run to the defence of themselves or their young. Such are also dogs and foxes which hunt in company, one of which pursues the game, while the other waits for it at its form, to which it never fails to come back.

A cat weary of always having her young carried away, determined to put them down in a granary. When the young ones of this last deportation began to grow up, and her milk did not suffice for their nourishment, she thought of transporting them to the kitchen ; the door was shut ;

she cried out to get it opened. The door being opened, she regained the stairs leading to the granary for the purpose of finding her young, but they being wild had run away at the noise of opening the kitchen door. This door was shut against the cat, who called again, and had the door again opened. The want of success in this first trial served her for a lesson : she entered a few paces, carressed the cook, and put herself in a posture to go out again and regain the staircase, but turning round every now and then to excite the curiosity of the woman and induce her to follow that she might understand the cat's proceedings. The cat succeeded. The cook surprised at this management, followed the uneasy mother, and found upon the stairs of the granary, the young ones who again took flight. The cook now comprehending the wishes of the old cat, left open the door of the kitchen, and seemed to pay no attention to what was going forward. The cat took advantage of the opportunity, and by calling her kittens to her, introduced them at length into the kitchen.

All these actions and a thousand others, which we could add to them,* incontestably prove that animals whose organization approaches ours to a certain point, have the faculty of feeling that they feel or perceive, and that they have felt or perceived different impressions ; and also they have the faculty of induction, (or deducing conclusions from a comparison of ideas.)

At length the infant gets hold of the instrument, *language* : he gets at it by the gradual progress of cerebral developement : he arrives at this point by leaving behind him the mere animal life, at whose level he was a short time ago : it is then he understands the meaning of *I feel that I feel*, or that he pronounces it himself. It is thus that the consciousness belonging to man, developed with the slow and successive progress of the encephalon, finishes by placing men far above all other animals.

Having now settled the characters of this faculty, let us see how the psychologists wish to use it as the base of a particular science.

Sec. 3. *If it be possible to make a science out of the mere phenomena of consciousness? Sources of error among the psychologists in relation to it.*

* The translator could add fifty of his own knowledge, demonstrative of thought and reasoning in animals. *Transl.*

They say we must listen to the language of consciousness; and for that purpose, collect ourselves in silence and obscurity, that no sense may be employed: we must abstract ourselves from every body in nature, in short we must listen to ourselves alone, and think. They affirm seriously that when we have been for a long time exercised in this kind of reverie, we discover an immense perspective, a new world, crowded with facts of the most admirable kind, and connected by natural relations, of which the laws may be discovered; facts moreover, that have nothing in common with those presented by the senses; facts whose assiduous contemplation, elevates the psychologist far above his fellow men, without excepting the naturalists and the physiologists, who are occupied about ideas furnished by the senses.

Let us then examine what they can find in their consciousness by proceeding in this mode of research. Independent of the faculty of feeling that we feel, they find two other sorts of things: but let us first speak of what is originally established in consciousness, and is surely found there.

The psychologists are sure to meet there, all the visceral sensations that are in correspondence with the brain; not merely hunger, thirst, venereal desires, the sensations of cold, heat, positive pain and pleasure, referred to some part of the system, but they will have to remark a crowd of other sensations vague, indeterminate, sometimes producing sadness, sometimes joy, sometimes action, sometimes rest; hope at one time, at another despair even to dread of existence. They will find all these sensations and emotions without any doubt in their minds concerning the source from whence they proceed; for the physiologists or rather the physicians who have paid most attention to the phenomena of visceral irritation, and the various degrees of insanity and whom they never consult, can alone give them information on this point. If they take all these internal sensations for revelations of the divinity, whom they call consciousness, they may greatly increase their riches of this description, by following the oriental custom of taking a dose of opium combined with aromatics. They will then find themselves like Mahomet, in connection with all that is most extraordinary in the empyreal heavens. But let us pass on to the second class of objects, which the psycho-

logist in his reverie cannot fail to discover in this consciousness of his.

He will find the recollection of impressions made upon his senses ; I do not say that he will see there, images, or impressions, or ideas considered as entities, but I will say, that while he is observing, he will perceive sensations* associated in such manner with bodies that have already impressed the senses for the first time, that these sensations cannot be renewed without compelling us to think of these same bodies. Consciousness then, is populated ; *first*, with materials produced internally, from the visceral nerves, and the nervous apparatus of the brain itself. *Secondly*, with materials produced by impressions made on the external senses. Moreover, these materials are associated together, mixed, confounded, identified in some manner or other ; and they are so to such a degree as we have shown in our physiology, that sensations proceeding from the visceral nerves, forcibly recal the attention to certain trains of ideas, the offspring of sensations furnished by the external senses ; nor can these acquire some degree of intensity in consciousness, without giving birth in their turn to visceral sensations.

Without this combination, man would have no motive to action ; a circumstance which I shall be compelled to consider by-and-bye : and this combination is the proper function of the encephalon considered in respect of innervation, sensitive and intellectual. It is by means of the impressions made upon the external senses, that the internal sensations are of any value to the individual. Hunger becomes a determinate sensation only by the presence of the recollection of some material object proper to satisfy it : and this value is not the same when the stomach is full as when it is empty : in its normal and its abnormal state : it is reciprocally, by sensations perceived simultaneously in the viscera, that those of the senses acquire a precise character : the sight of the other sex has not the same value to an infant or a sick person, as it has to the full grown man, in a state of health. One may say the same

* The French seem not sufficiently aware of Hartley's exposition of the doctrine of association : including sensations with sensations, sensations with ideas, sensations with muscular motions, voluntary and automatic ; ideas with muscular motions ; and all these with desires and emotions ; and the very important and most extensive application of this theory to the phenomena of intellect, instinct, health, and disease. *Transl.*

of all other sensations : for those which do not relate to our principal wants, as the sight of a triangle, may be connected with instinctive curiosity. What proves this, is, that this sensation is of no value to a child, whose instinct of curiosity is not yet developed, and whose brain is as yet imperfect ; just like a native idiot, whose brain has not grown in that portion of it which is assigned to intellectual phenomena : it signifies moreover, more or less to a grown man, well organized, according as he has exercised more or less, his faculty of observation, on that train of ideas which the triangle can recall to memory. But what value does it not acquire, in awakening that want of self satisfaction, which, as we have explained in our physiology cannot be excited to a certain degree of intensity, without developing sensations referable to the most important viscera ; to the same viscera which are excited by hunger, by thirst, by the fear of death, and all the phenomena of instinct ? In a word, let us do what we will, in abandoning ourselves to meditation, it is absolutely impossible not to awaken visceral sensations, and that instinct should not be put in action in concert with intelligence.

Hence the psychologist, in his reverie, will find nothing in his consciousness but mixed facts : it is wrongfully, therefore, that he pretends to build up with these facts, the edifice of a particular science, which shall be independent of facts observed by the senses : it will be impossible for him to assert, after this inspection of the interior, a single fact which will not require to be verified by the senses. This is what we must now undertake to prove, and for that purpose, we shall occupy his own ground.

He asserts, that his internal observation is something certain ; for there is nothing in the world more certain to him than to feel that he does feel, and that he has felt. Very well ; no doubt : we grant all that. It is certain that he enjoys when he does enjoy, and that he suffers when he does suffer ; and that he has a perception of the pleasure and pain which he experiences. Nobody ever dreamt of contesting with him this certainty, nor the reality upon which it is founded ; but because it is certain that a psychologist feels a body to be round and immovable, it does not follow that the body really is so : it may be square, and seem round while it is in motion, and if the senses did not interfere to give the required certainty, the psychologist would remain

all his life in error relative to the form of this body, and to another circumstance very important respecting it. This example may serve for all the cases of the same nature. The pretended certainty of high and low, of the immobility of the earth, and of a diurnal circle drawn around it by the sun, were formerly facts of consciousness; every body believed that he felt within himself the certainty of these pretended facts, and it has been by the aid of the senses that their falsehood has been definitively demonstrated.

But the psychologist will say, "you speak of physical facts of which the first motion came through the senses, but we have excluded these from the domain of consciousness. The questions about which we are occupied are those that relate to the nature of the intelligent principle, the faculties it possesses, and the morality of its actions. Upon all this, our consciousness alone can throw light, and cannot deceive us, while our senses teach us absolutely nothing."

To assure ourselves of this, we ask of the psychologists what their consciousness reveals to them of every thing? Let us begin with the question of the intelligent principle. We have already said that the ancient metaphysians attributed it to something independent of the nervous apparatus. Consciousness has taught our modern psychologists nothing more. The replies we have made to their predecessors we may therefore make to them. I shall therefore not repeat them. But I would ask of these gentlemen, so devoted to the worship of consciousness, if they really believe that this faculty is competent of itself and alone, to judge of the nature of the intelligent principle without the aid of the senses?

At the first blush, it is manifest that we cannot without absurdity suppose a man well organized, arrived at that point when he is able to reflect upon himself without having arrived there through the aid of the senses. What proves that we cannot make this supposition, is, that those unfortunate persons who are born without sight and hearing, are necessarily idiots. In the second place, all men who have offered opinions on the principle of intelligence, are philosophers who, for a long time before-hand, have exercised their senses by observation of external objects, and have been long familiarized with the instruments of language. It is not, therefore, consciousness alone which speaks through these men. Nor is it consciousness alone that speaks through

the psychologists of our day. Their intelligence works upon a mass of ideas acquired by the senses. Could any one doubt this, it would be sufficient to recur to the comparison which they make of a man directing the operations of some machine. They never would have had this idea, if their senses had not shewn them a man actually at work with a machine ; nor would they have had the means of proposing this comparison, if they did not possess the signs of language acquired only through the senses.

They pretend that they do not mean to suppose a man living in the human brain, but something that acts on the human organs, as a man acts on a machine. To this we answer for the thousandth time, that their notion of this something, is not derived from their abstracted meditation on consciousness, but suggested by the scenes of nature that have impressed their senses ; and we defy them to find a single idea in their psychology which is not copied from some object or scene in nature. So true is this, that they have not a single expression which they can apply to their subject which is not metaphorical, which does not mark all their conceptions of their science by words that have been invented to designate natural bodies and their properties, or the circumstances under which they have been offered to human observation.

They explain themselves on their principle, by saying that they mean to designate the unknown cause of intelligence. If they mean only to designate it as unknown, why do they use for this purpose, words and expressions appropriated to things known ? If they do not know how it differs from the nervous system, what right have they to assert that it cannot be the nervous system ? If they can venture to say of it, that it is not nervous matter—that it is not any species of composition—that it is something simple—surely they must have some idea of it. They ascribe to it positive qualities and negative qualities, and they say they do not understand it ; or if they choose to describe it, they use for that purpose an expression drawn from the exercise of the senses. This expression is deduced from the idea of a man, and is in truth the greatest honor they can do their principle, and the least bad of the arguments they advance in its favor ; for we have in fact ideas of a man directing a machine. But when they compare it to an ether, we do not see how a gas, which is a mere inert body, never exhibiting any signs of

intelligence, can perform intellectual operations, or without performing them itself, can make the nervous system perform them. When they insist that their principle is something necessarily simple, they think they have advanced an unanswerable argument. Where have they obtained the notion of a simple thing, compared with something of many parts, if not by observing natural bodies? But what idea can we have of something simple which is not a body, which nevertheless is so connected with the molecules of nervous substance, as to produce the phenomena of intelligence? If the psychologists had that idea, they ought also to have some word, some form of expression to transmit it intelligibly to others. What have they beyond their words or signs of some material body, to designate that which is not a body? What they really have of internal sensation, when they think strongly upon it, is some desire, some regret, a kind of anger because they cannot express themselves without using signs appropriated to bodies, and cannot avoid employing them, notwithstanding the strangeness of their style. It is the confused perceptions of all these sensations that they take as a proof of the existence of their incorporeal intelligent principle, made known by some *à priori* revelation. These men live in a constant effort of expression which, in their discourses, does but substitute one metaphor to another, and depraves their language, if it have no worse effect upon their intellect. In truth, their sensations on this subject are but irritations on the viscera, analogous to those which govern our instincts. The brain excites them; the other viscera return them, and again receive them from the brain; and the health of the splanchnic apparatus is not the better for all this.

It is now our business to ascertain if similar perceptions which have desire for their basis, prove any thing in the present question.

I lay it down as a principle, that one desire can prove no more than another in its kind. If any one possesses the means of disproving this assertion, let him do so. In mean time, I shall argue on this assumption. Almost every body desires riches and power: wise men require a tranquil, independent life. No one can deduce from these desires, that those who experience them ought some day or other to have them gratified. All we know is, that the thing is possible, because our senses have shewn it; but we do not

know this much of other desires whose gratification have never been an object of our senses. Many persons, for instance, would desire to preserve eternally their youth and vigor; the naturalist, the philosopher, the astronomer, would desire to know the first mover of all the phenomena which they study; almost all men would be glad to know the beginning and the end of bodies, of extension, of space, &c. Man lives continually in the midst of desires; but does it follow that he has the right to have all this knowledge imparted to him? Alas! an impenetrable veil hides forever all these mysteries from our eyes, and we have no good reason for pretending to explain one more than another. What right then has the psychologist to conclude from his desire of knowing the first cause of the intellectual faculties, that in fact he ought to know them? or from his desire of preserving these faculties when his brain shall be decomposed, that he has a right to preserve them? A wise man, reflecting on the manner of his acquiring his knowledge, soon finds out that his organization does not permit him to become acquainted with the cause of his organization. He places this knowledge among first causes inaccessible to human enquiry, or if you will, in the sole and general first cause. He submits, therefore—he represses the desire he entertained at first, and applies his faculties to the acquisition of useful, applicable knowledge. From that moment he becomes exempt from the internal sensations that pester the psychologist, who complains, no doubt very sincerely, that he exhausts his superfluous efforts to create a language which may give some notion of his insatiable desires.

Certainly the psychologist affords great room for censure in placing in the same rank consciousness and the senses; and in making them to be presided over by an intelligent principle, presumed to be simple, from I know not what comparison with material objects. The only thing certain, as to internal perceptions, is, that he who experiences them, experiences them effectually. I have just proved, that when the consciousness of the psychologist wishes to judge of itself, it models itself on the bodies which the senses have introduced to its acquaintance, nor can it abstract its first cause unless by a similar process. We have now, therefore, every reason to believe that it is not capable of judging of itself from its own resources alone. If it be true, that in this operation it has stood in need of the senses, it cannot

be independent of the senses ; but above all, it does not alone furnish to the principle of intelligence ; (which, out of compliment to the psychologists, I shall personify for a moment,) it cannot alone furnish, I repeat, facts equally certain with those furnished by the senses. The senses may undoubtedly mislead us as well as consciousness ; still they alone are able to furnish just ideas of bodies ; but consciousness cannot furnish any other incontestable fact—any fact, whatever, not resting on the evidence of the senses, excepting internal sensation. In other terms, I can affirm that I feel, that I feel myself feeling and wishing—that I have felt myself feeling and wishing ; but I can conclude nothing from thence, on the reality of those things which have been the objects of my feeling and wishing, unless I have recourse to the senses ; because it is very possible that I may have been deceived on the existence or the nature of these objects. I have furnished the proof of this already, by marking and specifying the mistakes of the ancient physicians. These proofs are also so abundant in every other branch of knowledge, that any one can find them without trouble.

Sec. 4. *Of the necessity of the senses and consciousness concurring to perfect the science of the sentient, thinking man.*

The testimony of consciousness then, is not of equal value with that of the senses. The science drawn from consciousness consists in the following assertion : *I am endowed with the faculty of feeling that I feel.* Here it ends. If you would erect a science on such a basis, you must go further and interrogate incessantly the senses for facts to be added to this assertion. If the psychologists presume they can succeed in any other way, they deceive themselves ; if they neglect this method they will equally go astray. I shall furnish them with another proof which may enable them to understand how dangerous it is to refer always and solely to internal feeling, or to believe that because any thing is desired, to be of a certain kind or description, no pains need be taken to ascertain whether it might not be something different.

“Man,” say the psychologists “feels within himself something different from his limbs, his flesh, his senses : it is an internal sentiment that raises him far above all other animals : man alone submits the whole universe to his examination : he alone studies and classes bodies and their

properties : he alone proceeds by induction from effects to causes : he alone raises himself to the contemplation of a supreme being. But, say they, it is not possible that the principle which gives these faculties, can be the same with that which presides over animals. This principle has something which partakes of the nature of the first cause. As it rules over the body, it cannot be confounded with the body ; it must be therefore of a nature superior to the bodily nervous system ; nor can we conceive it to be decomposed and destroyed, together with that system. All that we now say, (they add,) we have not learned from the external senses. It is our internal sense that inspires us with these ideas ; nor can we help considering them as realities."

They can be thus answered. "That you have these ideas, that you consider them as expressing real things, is what we cannot pretend to controvert, because this is the reality of *your* psychology : but that *we* ought to have the same ideas, is what you will never be able to demonstrate ; and still less, that they represent something real ; and this it is, that prevents our agreeing with you. You say that man feels internally all that you have stated. We answer, yes. The adult man, awake, healthy, having long exercised his senses, may feel all that : but the embryo, the fœtus, the infant, the human being, who is at once blind and deaf, does not : nor does a man, born an idiot, through defect of developement of the anterior part of the brain, feel any thing of the kind. Prove to us, that these two last examples of humanity do not form part of the human species : if you cannot do this, if you cannot show us, that the human nature of an embryo, of a blind and deaf man, of an idiot from birth, is not the same as that of a man of thirty years of age, well formed and healthy, if you cannot find between these, any difference but in the developement of their organs, we shall conclude, according to the evidence of our senses, that the principle of these ideas which you have stated, does not exist always and among all men, but only among men placed in certain circumstances. We may go farther : we will take any of your human beings who possess these ideas ; and by consequence, the principle that produces them ; we will follow him in his first sleep ; in apoplexy ; in asphyxy ; if he should have the misfortune of falling into it ; and after having interrogated him in these

different circumstances, our conclusion will be, that sometimes he has, and sometimes he has not this principle." "Oh ! but you say, he has it always, but it is not always in action ; we shall reply to this by-and-bye ; in the mean time, come with us to the lunatic hospital ; and there you may see twenty patients in a state of idiocy, who have had your principle, and will never have it again. Tell us then, if you please, if it be still there, in what corner is it hidden, or how can its activity rest without occupation ?"

Here then is the proof that the psychologists cannot demonstrate the continued existence of a principle different from nervous matter. They are compelled in order to escape this difficulty, to allege that their principle standing in need of the organs of the body, cannot appear unless when these organs are in a situation to obey it ; an assertion perfectly gratuitous, and equally absurd ; because it contains a manifest contradiction : you make use of the actual existence of the intellectual phenomena, to prove that the principle, which is not nervous matter, is present to produce them ; and you make use of the non-existence of these same phenomena, to prove that it is still there, in the same place : from its having appeared you conclude it cannot disappear ; your reason for this is, that you have admitted its presence ; and although we hear you declare that you do not understand the intimate nature of this principle, you assume that it is such that it cannot ever quit the brain while this lives ; even when years may pass without any marks of its presence (as in the insanity of ideocy) and death may ensue without the patient having recovered his reason. You venture still further ; for after deducing your principle from the intellectual functions of the highest order, you boldly confer it on the embryo, who does not yet possess these functions, who has as yet no brain, who consists of nothing but a mass of vessels and fluids in which the organs are not marked. Have you well reflected on this mass of hypotheses, each more singular, more chimerical than the other ?

How comes it that you have thus lost yourself in this labyrinth of suppositions ? It is because you have given credit to this internal sentiment, which says, (if we can trust your representations) that it is simple, that it is independent of your organs, that it is not of the same nature with that which presides over animals, that it has always existed, and

will always exist. What right has this principle to affirm to you all these things, while alone and without the aid of the senses, it cannot give you one idea, of the beginning, or the end, or the interruption of action of the organ by which it makes itself manifest? Does your internal sentiment teach you that you were once an embryo, an infant, and that some day or other you will die? If you believed nobody but this principle, would you not believe that your organs were immortal? Whence have you taken the notion of this permanence without organs of which it speaks as you tell us, if it be not in the successive impressions of the bodies which act upon the senses? Who told you there were animals existing with some analogies to yourselves, but the senses? Whence comes it then that to satisfy your desire of being of some other nature than the rest of the universe, you believe your senses, when they tell you that every living body dies, without the possibility of recovering the phenomena of their nervous functions, while you refuse credit to the testimony of the same senses, when they shew you clear as the day, that your intellectual phenomena, are also the results of the action of perishable nervous matter? How comes it that to affirm the contrary, to maintain that you can think without nerves and without brain, you refer to an internal sentiment, incompetent to judge of space, of time, of matter, or of any of the substances formed of it? Above all, how happens it that the most strange conclusion is every moment advanced, that although sight proceeds from the eye, hearing from the ear, and touch from the nervous extremities of the skin, yet thought proceeds not from the brain? Is not the evidence the same? You admit the office of the senses in the production of ideas which represent the bodies, because you say you feel the senses act; yet you deny that reflection is an operation of the brain, because you cannot see your brain in action! Be uniform in your conclusions. Since it is by your senses that you verify the evidence of your consciousness which tells you that the idea of colour proceeds from the sense of sight, verify in like manner the pretended evidence of the same faculty, when it seems to tell you that it is not your brain that thinks or reflects. You do not refer yourself to your body for the functions of the eye. You have ascertained them in other persons as well as yourself by proofs negative, and positive. You have thus convinced yourself that those who have lost their eyes become blind

and lose the sense of colours ; observe other persons therefore on the question of thinking, and you will soon become convinced that thought is developed, is altered, impaired, and destroyed, in proportion as the brain is ; that he who loses his head, loses the power of thinking, as he who loses his eye loses the perception of colours.

Were it true, as you repeat incessantly, that you confine yourselves to the evidence of consciousness in judging of your sensitive and active faculties, you may object to us, that we wander from the question : but we have proved to you that you do not so confine yourselves ; that you never cease to work upon the impressions proceeding from the senses ; even when the question is concerning the nature and duration of the principle of your intellectual phenomena. Upon what then is founded your psychology ? upon a false operation of your understanding, upon whose mechanism you have not reflected. You generalise the fact of thought and of reflection, which you have observed in its highest degree of perfection in some grown up man, healthy, possessing all his senses, having exercised them conjointly with his understanding during forty or fifty years, and master also of a perfect language ; you make this fact an attribute of every man, and you make it also something independent of the nervous system. Not being able to discover this attribute in the innumerable cases of exception which we have so often cited ; you are reduced to suppositions, to sustain its existence in a substance with which it is agreed it can have no contact ; and to explain the frequent absence of its actual manifestation. Recurring to your senses, which you unfairly call in as witnesses, to furnish you with comparisons relating to an object, to which according to yourselves they cannot be applied, you affirm without hesitation, that when this attribute does not appear, it is like a star obscured by a cloud ; or like a musician placed in an organ dismounted, and which he can no longer put in operation ; or like a master whose servants refuse to obey him ; or like a skilful and active workman, who remains for years together with his arms folded, in the midst of rough materials, waiting until they have been prepared for him ; then working with them for some time, and again resting for a much longer time ; waiting idly in the midst of an animated machine, till its destruction shall be complete.

If you are resolved to sustain the existence of your prin-

uple, say at once that you feel it : assert it on your own authority. Those who feel it as you do, will repeat your assertions ; do not undertake to prove its existence to those who do not feel it ; for you cannot get on with them without reasoning to the phenomena of the senses, and exposing yourselves to refutation. For the same reason, do not pretend to make a regular science of the facts of consciousness ; they are neither numerous enough, nor sufficiently connected with social life, to enable you to succeed. Keep your hypothesis then of an intelligent principle that has nothing to do with nervous matter, as the secret mover of your own actions. Such an hypothesis may be useful to certain kinds of intellect.

The psychologists hold in great estimation the faculty of induction (drawing conclusions from a comparison of facts) in favour of a principle (not partaking of a nervous nature) which holds the government of the brain ; but they never introduce it except to explain intellectual action.

If we believe them, to deduce from sensible phenomenon the conclusion that it must have a cause ; that it exists for some purpose ; that some principle of intelligence directs it ; and that it implies some change taken place in the body wherein it is manifested ; is to have ideas *à priori*, of some cause not nervous which moves the nerves, some cause in connection with the first cause ; while our senses can give no information either of the cause, the intent, the promotor of the phenomena, nor the change which constitutes them. It is thus, say they, that from one of the phenomena of a function we deduce all the rest ; and although we cannot establish them by means of the senses, we are persuaded they exist, and we make experiments to discover them.

When I read these psychological arguments ; I know not where I am : I seem to be among men differently organized from myself ; for if I enter into my own feelings and interrogate my consciousness as to the value of this deduction, I find I can employ it indeed, but as one of the strongest proofs that our ideas come from our senses only. In fact all inductions are only comparisons. It is because from his most early years, man is accustomed to see causes produce effects ; it is because he himself becomes in various instances a cause of effects ; because he is continually led to become so ; because he feels pleasure in seeing himself obeyed ; in seeing inanimate objects yield to his efforts as well as those that are animated ; it is because he always has some inten-

tion, some proposed end in view, when he performs these acts, of which his fellow men give him perpetually examples; it is because he sees that he produces changes in the bodies submitted to his action; in a word, because the intentional modification of every thing that surrounds him, is almost the whole of his education during life, and he carries of necessity this modification into all the phenomena of nature—it is from these known circumstances that the induction is drawn. He is convinced (they tell us) although he has not seen the causes, nor received the confidence of authors, nor explained the secrets of these transformations.

No doubt: the more ignorant a man is, the more credulous he is; and having received an education embracing causality and intention, he is necessarily carried on to judge of what he does not know, by what he does know: he no longer loves to doubt; rather than stop there, he seizes the first glimpse of probability that strikes him, and becomes as thoroughly convinced, as if he had verified his belief by the aid of all his senses. This is his method of proceeding; it answers his purpose in intellectual operations on common things. He does not like therefore to abandon it; and a long and laborious education becomes necessary before he can acquire the courage to doubt, although his credulity has a thousand times over led him astray. One might compose volumes consisting of the simple enumeration of well known errors in the sciences depending on facts, which have been owing to hasty conclusions, and which subsequent discoveries have rectified. But without going to ages past, it suffices to look around us, to collect by thousands, examples of prejudices more or less absurd, in religion, in politics, in medicine, &c. brought forth by the operation of induction, or deducing conclusions; that ever active unrestrainable propensity which carries man to judge of what he does not know, by what he thinks he knows. This is the chief source of his mistakes. As he can guess at nothing to any good purpose, he must depend on chance setting before him facts, before he can escape from errors of false analogies. Hence his education really depends on his senses. Of this, our psychologists furnish an example worth all the rest. They are so much in the habit of transferring the known to the unknown, that in place of frankly acknowledging their ignorance of the nature of intellectual phenomena, they place a machinist (not nervous) in the

brain of the human species only, at the risk of being compelled to argue rashly, inconsequently, and ignorantly upon the object of their investigations, 1st in comparing the living and active nerves to a machine passive and inert; 2dly in being able to give no description of this machinist who inhabits the brain, but what their senses have furnished them with from the man himself; 3dly in attributing to the nervous system of animals, exactly the same phenomena that they attribute in man to some incorporeal intelligence; as sensation, memory, volition. These are, I should presume, instances sufficient of those precipitate judgements which the habitude we have spoken of betray men into.

A great deal more is wanting than some *à priori* notions, to indicate beforehand to the physiologists, the end they ought to pursue, and the experiments they ought to set on foot to arrive at the full discovery of a function, which is not yet known but by some of its phenomena. Every physiologist is an anatomist; he examines the organs of the body; he sees them act; having learnt by the exercise of his senses the action of the first that he examines, he discovers the mode of action in others; where he does not clearly distinguish their uses, he conjectures by analogy enough to lead him to those experiments of putting them in action, which may teach what functions they really perform. Have they not from infancy, data furnished by their senses as to the use of all the external parts of the body? How then when they come to the internal, can they avoid applying the same rules of judging as to the organs that are concealed? If they have not this analogy, they have others: Harvey was led to suspect the circulation of the blood from remarking the direction of the valves in the veins. Others had already drawn the same conclusion from the same fact. But what does this signify? The first who made this deduction found the elements of his theory in nature; in the shrubs and branches of trees, in hydraulic machines, &c. There was no need of any *à priori* inspiration to conclude that the valves were destined to prevent the blood from flowing back, and that as it had clearly passed through these valves and was again found behind them, it could not arrive there but by a circular course. This conclusion and the facts and experiments that suggested it, are not extraordinary, but the lateness of the period at which observers arrived at them, is truly so.

Let the psychologists shew us one man deprived of his senses from the moment of birth, or possessed of his senses but with a very diminutive forehead, and who was able to deduce these truths: this would be an experiment directly in point to which we could not avoid giving credit. But so long as we are able to find in the phenomena observed by the senses, the models of the phenomena discovered by induction, we shall never be able to find any good reason for attributing this discovery to consciousness.

Sec. 5. *Comparison of the hypothesis of the psychologists, with the opinion of the physiologists on the appreciable cause of intellectual phenomena.*

Chagrined at being unable to support their non-nervous principle, otherwise than by hypothesis, some psychologists have tried to console themselves by maintaining that the opposite opinion which refers the phenomena of intelligence to the nervous apparatus, is itself no more than an hypothesis. To maintain this position, they reason as follows :

They distinguish in the phenomena of life, 1st The facts which are independent of the intelligent and voluntary principle, and of sensibility. 2dly The facts wherein this principle intervenes.

The facts that take place *independent* of this principle, are the two great internal classes of nutrition and reproduction. The facts that *depend* on this principle, constitute the third great function of life, that of relation (forming our relation to and connection with external objects).

According to them, it is one and the same principle which feels in the phenomena of sensation; which knows in the phenomena of perception of external objects; and which wills in all cases of voluntary action. Sensation, idea, volition, are then the integrant elements of all the phenomena of relation. These are facts of consciousness which fall not within the jurisdiction of the senses, are not the objects of sensible observation, and consequently cannot be learnt, but must reveal themselves anteriorily to all investigation, to which indeed they are the only motive.

I consider this as the strongest argument which the psychologists have employed to deprive the nervous system of the phenomena of relation, and to place them under the guidance of a principle, whereof they agree that we can form no idea: that is to say, to demolish without hope of reconstructing. I attack this argument with the aids furnished by common sense.

Nutrition is never independent of the phenomena of relation except in the fœtus. It is so in that instance, because nutrition is a consequence of the small portion of the liquid fecundated. The first nutrition is nothing but the play of molecular affinities. To this is added, the mechanical impulse given to the blood by the vitality of the heart of the fœtus, and that of the placenta and umbilical vessels. The means of relation to the external objects commences at birth, when the brain by means of the external senses perceives the impression of the air, and the breast of the mother; but this relation unaccompanied by intelligence, is but instinctive. By and by, the brain being grown and developed in company with the organs of sense and the muscles, that is to say, with the instruments of the new functions which it is called upon to perform, the interior phenomena of intelligence, and the acts that mark it, become the first instruments of nutrition: this is demonstrated, inasmuch as the human being existing in a state of complete imbecility would die of hunger, if the intelligence of some other human being did not provide for his nutrition. Let now the psychologists tell us if they can, whether between the embryo or the infant of a day old, and the man of thirty years, any other differences can be pointed out in respect of nutrition, than those which I have stated: and if they are determined to introduce their non-nervous principle, let them tell us at what precise epoch it makes its first appearance.

The phenomena of relation, moreover, (connection with external objects,) are still more essential to the reproductive function; for the senses (which I presume are the principle means of relation) are the only means of discovering the difference of sex, and the only means which can furnish to the male and female the requisite inclination to intercourse.

If the psychologists separate from nutrition and reproduction, every thing that intelligence has to do with these functions, they would not be the functions of vertebrous animals, but of zoophytes, where nutrition is no more than molecular affinity, and reproduction an accidental section or separation of a part. If they pretend to understand by the words *nutrition and reproduction*, nothing but the phenomena of contractility, circulation, absorption, affinities, and changes of form of animal matter, they will not include instinctive phe-

nomena. If they are determined to introduce them, I shall prove to them by referring to what I have said on the education of the infant, that intelligence is nothing but instinct brought to its perfection *under certain relations*, by the developement of the encephalon in certain directions easy to be designated.

Having thus marked the duty of the principle which feels and which wills in the internal functions, let us examine the same principle in its external, or functions of relation. Sensation, idea, volition, are, say they, facts of consciousness which the senses cannot take cognizance of. Let us distinguish. Is the question concerning ourselves, or concerning others? If the latter, assuredly we have no method of discovering these faculties, but by our senses. Does it relate to ourselves? Undoubtedly when we feel, or think, or will, we do not see ourselves do this. But without the senses, what can we make of this fact? What can a man say—what can he do with this internal sensation of his own, if he does not compare it with that of other men, of whom he can have no idea but by means of his senses? Still more: With these internal perceptions alone, would he possess any ideas of any things? Would he have volition? Let the deaf and blind by birth, answer this. Man possesses no intellectual faculties, but because his internal sensations connect themselves with some external object, or some part of his own body perceptible to his senses, as their determining causes; to speak of their combined faculties of feeling, of possessing ideas, and of willing, as of a simple fact, purely internal, is to speak of what does not exist. Independent of the perceptions that have their source in the senses, nothing remains but a confused feeling of existence. What do I say? No: not even that; for the blind and deaf, are observed to have a feeling in the skin, which is to them an external one. They can at least compare the sensations thence arising with those which the food they take furnishes, and perhaps the genital sense; and certainly with that which is furnished them by the movement of their limbs.*

* Nobody can draw any acknowledgment from these unhappy subjects, of what they feel internally. They are to us like the embryo, or the molluscar animals. Such is the consequence of the imperfection of the senses. The imperfection of the anterior part of the brain is nearly the same. A short time ago, a young girl of twenty years of age was presented to different scientific bodies at Paris, who possessed scarcely any forehead, and no more intellect than a child of six months old, altho'

To affirm, therefore, that the internal sensation of existence, the idea of external objects, the volition to approach them, or take hold of them, are in man, phenomena anterior to all perception arising from the senses, is to affirm what is not true. For the fact is, that we cannot observe ourselves without observing at the same time bodies that are not ourselves: it is astonishing, that in the 19th century it is necessary to assert over again a truth so ancient. It follows then, that the notion of an internal perception, of an idea, of volition, are the results of observation made by the senses in those who possess senses, and cannot be acquired by those who have not yet acquired them, without the aid of sensible observation; an assertion directly contrary to that of the psychologists. We may say then, in contradiction to these authors, that the faculties in question are formed, and take up their abode in man by the simultaneous exercise of the brain and the senses: they do not exist, therefore, anteriorly to sensible observation, are not self-existent, and have no existence *à priori*.

Sec. 6. *What the objections of the psychologists really amount to on final analysis. Solution of the foregoing question.*

Although we have proved to the psychologists that the idea of consciousness itself is derived from the senses, and therefore we cannot consent to allow it the privilege of placing itself precedently to all perception, many of them may yet remain unconvinced. Personal identity, *le moi*, myself, takes precedence of all, say they; for it is the sole motive of the researches we make to come at the knowledge of it; for to speak definitively, *if we have never had perception, we should never have thought of investigating how perception arises.*

Recollect, gentlemen, the replies already made. I have proved, I trust, that ideas and volition always imply sensitive perceptions;* I have shewn that mere internal perception, of itself, and without sensitive perception, amounts to a mere fact of sensation which you can do nothing with, and which renders no service to your system. Why then do you persist in deducing from the observation made by myself,

she had her external senses well developed. It is not enough, therefore, to have senses; there must be a brain proper to make use of the perceptions furnished by the senses.

*Perceptions originating by impressions on the senses.—*Transl.*

on myself, the existence of this same myself anterior to all sensitive observation? There is a play of words in this case that deceives you; some ontological enigma which it may be worth while to unriddle. Does not your obstinacy depend on your personification of *le moi*, myself? I think I have hit the mark. You say to yourselves, "no man observes unless he be furnished with all the means and apparatus of observation: *le moi*, the myself which is within a man, ought to be presumed in that situation." Stop, gentlemen, take care that your *moi* (myself) does not come forth suddenly, a Minerva armed cap a pie: remember what has just been proved, that the word *moi*, myself, cannot designate any thing but a phenomenon which shews itself under certain given conditions, consisting in—1st, The existence of a perfect brain, well grown, and of adult age. 2dly In the fact of certain stimulations, at first internal, subsequently external, transmitted to the brain. It is only under these conditions that *le moi*, myself, exists at all; nor can any myself be compared but with itself. Cease then to judge of it by false comparisons, and adopt a different idea concerning it.

Your obstinacy may have another source. Teased on the one hand by the testimony of your senses, which teaches you that myself disappears so soon as the head is severed from the body, and compels you to acknowledge that this myself depends upon the brain; wearied on the other hand by useless endeavors to explain how the brain can be the seat of this myself, without the latter resolving itself into a phenomenon of cerebral action—you become resolved to apply to consciousness for some information respecting the nature of this myself, that is to say of consciousness; for how differs consciousness from *le moi*, myself? Consciousness, which has no idea whatever of duration, destruction, reproduction, talks to you in its own language. It is nothing but a sensation inseparable from existence. It answers you, that myself is an existence independent of all accident. But this is a contradiction to your senses, and you find yourselves unable to explain this *moi*, myself. The doctrine of sensations is old. Some philosophers of the north, who never understood it, have discredited it in your eyes, to establish consciousness on its ruins. This consciousness is of late date in the history of philosophy; but it is in fashion: it inspires you with a sentiment of pride which is dear to you,

and which the senses would deprive you of, by destroying the illusions of your internal sensation. All this induces you to decide, and you determine to say, "since our conscience refuses to believe that she depends on the brain"—since the senses, which seem to affirm the contrary, cannot explain it, we conclude "that it cannot be so, and that it precedes the brain."

So then you choose to deny a fact because you cannot explain it ! Think a little where this will carry you. I do not wish to dwell on the consequences that would result.

I use another argument. Having proved that we observe by means of a brain connected with the senses, and that the only difficulty is *how* this is possible, I reduce your objection to this possibility ; and I say, "if we had not the power of observing ourselves, if to do so were impossible, we should never seek to do so." This expresses a common truth, equally applicable to the observation we make by means of the senses. Thus, "if the faculty of observing others and ourselves was not formed in us by the developement of our brain and the exercise of our senses, we should not seek to observe either ourselves, or any other object in nature." That is to say, "we observe because we are able to observe."

You see your objection is not single : but as the difficulty consists in the impossibility of explaining how and why the faculty of observation is placed in the nervous substance of the encephalon, it is no concession made by the naturalists, physiologists, and anatomists to your doctrine, that they acknowledge the existence of facts that the senses cannot explain, or that they know no more than I do, how and why man possesses feelings, ideas, and volitions. You are kind enough to pity this ignorance, and you add "we will teach you all this. The reason is, that for the production of these phenomena, and the execution of these functions, man possesses something within, that differs from his own nervous substance and from that of all other animals, and from every thing which is the object of sense in the universe. Something in fact, of which no one can form any other idea, than that it does not resemble any thing whatever of which we are able to form an idea."

We have then at length reached the final question after so many impediments. The psychologists say, that they have perceptions, ideas, and volitions, precisely because

they possess for that purpose something that no other animal possesses, who like man, has also perceptions, ideas, and volitions. Then their perceptions, ideas, and volitions, must be of a different nature from those of other animals. We have noticed already the recollection and the volition of the dog, the wolf, the fox, the cat ; we have seen that they are exhibited in opposition to sensitive impressions, this implies something within, some internal perception, consciousness. On the other hand, we have exhibited man, of imperfect age, and imperfect organization, possessing neither perception, or volition, and of course ideas neither so distinct or complete, as we see them in animals. If this does not depend on the perfection or nonperfection of the nervous apparatus of these living animals, will these gentlemen be good enough to inform us on what it does depend ? Is there not contradiction in ascribing the very same phenomena to nervous substance in animals, and to something very different in men ? In pretending that the chief source of motion in animals is the nervous apparatus, which in man is only an inferior and secondary instrument ? Let us act honestly. Is there any good reason for assigning to man a principle which animals do not possess ? There can be no reason for it, unless man possess intellectual faculties which other animals do not : for it is not to be denied that the organs which put these faculties in operation, are the same in men and in other animals, excepting that the organs of man being more complicated and more perfect, are able to execute intellectual operations, which those of other animals cannot. This may be wonderful. But when the animal executes intellectual operations which the human being is not equal to—as when we compare a full grown well educated dog to a new born infant, where is the proof of any principle existing except nervous matter ? Let the psychologists choose their side. They must place this principle somewhere ; they cannot put it on the road, travelling toward its destination, nor can they conceal it in the brain and leave it there in perfect idleness, as they used to do formerly before they fabricated hypotheses.

On the other hand, the physiologists advance no hypothesis, when setting out from certain known, and acknowledged facts, namely, that sensation, thought, volition, are developed with and in proportion as the cerebral substance is developed ; diminished and augmented as that substance

is so ; disappearing forever when the brain disappears ; and shewing themselves connected with the brain as an effect is with its cause, in every possible case where an animal possessing a nervous apparatus can be observed—they advance I say, nothing like hypothesis or supposition, when they conclude that these faculties are nothing else than the results of the operations and functions of the brain and nervous system.

It is true, the physiologists have taken the facts from which they reason from the evidence of their senses, but they have deduced from these facts no forced, no contradictory conclusions ; while the psychologists who have also pushed their opposite arguments into the perceptions of sense, as I have superabundantly shewn, have drawn conclusions which no rules of sound logic can justify. This it will be well to shew them definitely. For this purpose, I shall concentrate their arguments, which are exactly such as they employ to prove, that to attribute thought to a nervous apparatus, is an hypothesis far less probable than that which attributes it to a principle in man, that is not bestowed upon other animals.

1st objection of the psychologists. To attribute to an organized apparatus the faculty of producing thought, &c. is to attribute to it what we can never discover in it. ¶ We acknowledge dependence of the phenomena on the apparatus ; but as the results of the action of this apparatus, would be exactly the same if it were no other than a mere instrument, there is no reason why we should not so consider it, or why we should prefer the hypothesis of our adversaries to our own.

Reply. We discover perfectly in this apparatus the faculty of producing thought, &c. What we do not pretend to discover, is the manner how this is produced. This proposition has been already demonstrated.

The dependence of the phenomena on the apparatus, cannot be explained by means of a separate intelligent cause having no relation to nervous matter ; this is an hypothesis merely ; the type or model of this cause no where exists. We cannot admit that what is in no sense matter or body, can act upon matter or body. A mere negation cannot act upon that which is positive.

2nd Objection. Observation can shew us nothing but material particles arranged in a certain manner. As no

molecule of the mass can produce these phenomena, the physiologists themselves cannot comprehend how the mass, or arranged assemblage of molecules, can produce them; they must therefore recur to supposition and hypothesis.

Organization, therefore, proves no more than any other word of any other sound.

Reply. It has been proved that the nervous apparatus in a certain state, does produce by its action, intellectual phenomena in animals as well as in man. This then is the question before us, the fact itself, and not the *how* and the *why*. Hypothesis begins so soon as we go beyond the matter of fact and offer to comment on it. The physiologists make no comments; the psychologists alone keep their imagination alive.

3d Objection. In machines we have examples of organized matter put into action by separate intelligent beings. We have nothing like, nothing equivalent to this in the supposed organization which gives rise to intellectual faculties. Hypothesis is, therefore, against hypothesis, that of the psychologists is preferable.

Reply. There is no room for comparison between an inanimate machine, and the living, organized, cerebral apparatus. Moreover, the intelligence which the psychologists shew us in their machine, is nothing else than the cerebral apparatus of the man himself who moves and directs it: but to suppose one cerebral organ within another, would be an absurdity explaining nothing.

4th Objection. The nerves, the senses, the muscles, being indispensable to sensation and action, and being no more than instruments of the brain, without which they can do nothing, we can have no difficulty in supposing how a brain also may itself be in the same inactive situation as the senses and muscles, in respect of that presiding principle of which it is but the instrument.

Reply. There is no parity in the things compared. Our senses shew us that nerves and muscles are capable of action independently of the brain; that action, however, cannot be regulated but by means of the brain; so as that the result of these motions afford us an idea of an inciting intelligence. But no sense has ever demonstrated to the psychologists, that the brain was the instrument of any other agent, than the whole nervous system with which it is connected. The brain and the nerves are successively, and in

turns agents and patients ; in this circle there is no point to designate a beginning or an end. As to the muscles, they can only serve as instruments of the brain and nerves, for the execution of certain acts which the nervous apparatus was not designed to execute ; although the muscular tissue is sometimes subject to other influences.

5th Objection. By destroying certain parts of the brain, in experimenting on living animals, certain actions are destroyed also. Diseases also analyse the human faculties, abolishing one after another : but no disease has yet destroyed the will. This happens, according to certain psychologists, from the principle of voluntariness being distinct from the brain. For if the brain itself were the principle of voluntariness, when you altered the brain you would alter also the voluntary principle : but no operation, no disease has produced this effect.

Reply. Let us attend to facts. It is not true that experiments have not destroyed volition. You may suspend and you may renew it by merely compressing the brain. Nor is it true that no disease has yet destroyed volition : all the violent congestions of the brain suppress it ; all violent inflammations of that organ put an end to volition while they continue, and by their long duration ; and life may remain a long time even after this loss. Moreover, the embryo has no voluntariness, and the embryo we presume partakes of the nature of man.

And now what becomes of the railleries of the psychologists on the supposed hypothesis of the physiologists ?

Seeing that it is demonstrated by reasonings founded on the known evidence of a man's senses, without which there can be no knowledge, that the nervous apparatus, consisting of the encephalon and the nerves distributed to all parts of the body, is the source of all the phenomena of instinct, of sensibility, of perception, of volition, in one word, of intelligence—seeing that you cannot impose upon that apparatus a separate, stronger principle, without introducing by means of thought, within the brain itself all the scenes of the material world, of which the senses alone can furnish any ideas—the pretensions of the psychologists fall of themselves. The *how*, or the first cause, remains equally unknown to the one disputant and the other. But this circumstance of being unknown as to the first cause, is no obstacle to researches whose object extends no farther than the pheno-

mena, the facts of the sensible world. That this first cause should remain unknown, is of no consequence to physiologists, moralists, publicists, and legislators. As to metaphysicians and psychologists, it is a very different thing. They cannot, unfortunately, erect a science on the basis of consciousness alone, independent of the influence of the senses, because all the phenomena of this, their consciousness are reduced to this single expression, *I feel that I feel*. Beyond this they cannot go, without calling in the aid of the senses. If they would confine their pretensions to the study of those relations, which bind man to man, they would enlist among the moralists and publicists : if they will pretend to discuss the actual origin of the intellectual faculties, let them study physiology, anatomy and even pathology, not in books, but at the bedside of the sick. This last occupation will teach them far more than all the treatises on ideology. All the efforts they make to emancipate themselves from the influence of these branches of knowledge will prove useless, because without them no one can be acquainted with the facts necessary to treat the question properly. Consciousness was their last refuge ; hereafter it will serve them in no stead ; they cannot with any success oppose sophisms and declamations to the facts which we have exhibited. But I shall give them credit for more judgement and coolness than to choose such weapons.

Sec. 7. Of the rationalists and modern theologians.

Hitherto I have spoken only of psychologists who take into consideration the evidence of their senses, and who pride themselves on the strictness of their reasoning. But there are some who pay no attention to what their organs of sense report to them. They set out at once from consciousness as a starting point to arrive at *reason* : this being once discovered, becomes the oracle of all their philosophy. In the name of reason, they employ arguments to despoil the nervous apparatus of all its functions. I do not aspire to the honor of convincing them by reasoning, although they tell us they are the interpreters of reason. For what can I say to men who profess the following doctrine. "Reason is that which places a man in connection with the Deity. It is an emanation from the Deity. The identical, individual being, *le moi*, (myself,) is susceptible of feeling, of willing, of perceiving : he rests upon his volition, and he is connected with

the visible phenomenal world by his senses; with the invisible, substantial, rational world, by his reason.”*

They admit, like the psychologists already noticed, the nonsensical nature of *le moi*, (the being or principle that constitutes myself,) and the characteristic of consciousness “*I feel that I feel*,” but their principal argument for forcing upon the nervous system a presiding principle, is drawn from what they advance founded on authority and without any proof, concerning reason. “Reason, say they, gives us what experience cannot furnish, to wit, principle, the laws of man, the laws of nature, and the supreme law. In fact, laws being necessary and universal, cannot be deduced from what is contingent and personal. Reason which teaches these laws cannot be contingent or personal. These laws are absolute: reason, therefore, is so also. Nor does she belong to space or time. She appears to the individual man, as the preserver of his impersonality. The Deity is the absolute, substantial law. Man raises himself to the Deity by his reason; but he knows that great Being imperfectly, because man is limited to space and time.”

I have argued with the psychologists, properly so called, because they profess to reason rigidly. But how shall I argue with rationalists, who pretend to no strictness in their deductions, and who scruple not to advance as truths, assertions mysterious and unintelligible, such as that reason, altho’ an impersonal being, belongs to the individual man? They speak of man, as if he were of a nature superior to man. I do not ask them to define the words they use; they will not descend so low as to definition and the grammar. They fly off into some ideal world, from whence they look down with pity on what passes in this.

Without addressing *them*, I shall make some remarks on the language they employ. “*Reason is an emanation from the Deity.*” A metaphor in which God is likened to some planet, or some spring; and reason to the rays of light or the streams of water, or some other emanation still more

*I am not satisfied that I understand this passage. “*La raison est ce que met l’homme en rapport avec l’absolu: cest une emanation de Dieu; qui n’est autre chose que cet absolu, ou de cet absolu qui est Dieu. Le moi est susceptible de sentir, de vouloir, et de concevoir; il se pose par sa volonté, et il est en rapport avec le monde visible, phenomenal, par ses sens; et par la raison, avec le monde invisible, rationel, substantiel.*” I am persuaded I have given the sense of the passage, but I cannot render l’absolu.—*Transl.*

subtile, which flows from it. Before I can admit that reason is any thing of this kind, I want to know how they arrive at the knowledge that reason is really such. They tell me they acquire this knowledge by their consciousness; that *Janus* which by one of its faces looks at and comprehends reason speaking in the name of the Deity, and by the other, puts himself through his senses in relation with a world of facts and of material things. I ask myself, is not this degrading the Deity, to convert him into a body capable of emitting material emanations? If, on the other hand, reason is to be regarded like a fluid that flows, which hears without ears, and speaks without a mouth to consciousness who has no organs of hearing—is not this mere fancy?

Let us, however, admit that consciousness, who has no auditory organs, has heard all that reason has uttered, whom no one has ever seen; to whom did consciousness relate this before the rationalist spake of it? To herself doubtless, unless some other being was present, endowed with the faculty of hearing. Be all this as it may, the internal being who has learnt all these wonders, must have some organs of speech to enable all this to come to the ears of the profane, so that these latter may give themselves up to their respective consciousnesses. I say to their consciousnesses, for each of them has one of his own. Consciousness is not one universal being, serving the turn of all mankind; and this throws us into the difficulties before noticed. Why has not the foetus a consciousness? If it have, why does not consciousness understand it? Why does not consciousness speak to it? If absent, where is she? If there be an entity called consciousness, common to all men, why does she not speak to the embryo, or to persons apoplectic, or afflicted with asphyxy?

Let us add, but for ourselves only and without addressing the rationalists, the following question.

Why is it that consciousness, for the purpose of teaching these mysteries, is constrained to use language appertaining to the properties of material bodies? I must suppose that it is, because like ourselves, these rationalists are compelled to have recourse to objects, which their senses have made known to them, to enable other men to understand their thoughts; and this brings to my mind that we cannot discourse at all of abstract entities, but by means of attributes belonging to material bodies. Is not reason reduced

to the same necessity? do we not say a good, a bad, a just, a fine, a forcible reason? Is not time itself qualified by expressions drawn from the dimensions of bodies; and can we figure to ourselves a day, an hour, &c. without including some material idea of space? How is it possible that ever since men spake at all, they have never been able to invent, for the purpose of conveying an idea of abstract substantives, a single adjective but what represents one of those qualities or properties which belong to material substances.

Let us ask, (ourselves however) what is the meaning of all this? It means that in good truth we are so much the slaves of our senses, that we are compelled to compare abstract beings to the bodies which our senses have made us acquainted with. This necessity arises, because these pretended (abstract) substances, are themselves nothing else than words and signs, by which, during perception, we recall the manner in which we have been modified (acted on) by the given circumstances. But as our senses are modified (acted upon) by bodies alone, and in consequence our brain is so too, we cannot qualify these modifications, unless by words or signs that recall to our memories either the bodies themselves or the impressions they have made upon us; even these impressions are designated by the qualifiers of material bodies. Thus, we say a *lively* joy, a *great* surprise, &c. A man pronounces the word virtue: the idea does not instantly occur to us that he considers virtue as some body; but ask him to join to that substantive word some adjective, and he will no where find one, unless among the properties of bodies, or the modifications of his own body: and virtue always must be great or small, or sweet or austere, or savage or gentle, and so on. There is no adjective but *divine* that does not recall some material body: but if man would apply any qualification to the Deity, he must patch it; he cannot avoid using some adjective drawn from a material substance; and those epithets which are most worthy of the occasion are those which apply to man; employed by multiplying supposedly and indefinitely whatever he is or whatever he does of a more distinguished character; as by calling him infinitely great, good, wise, foreseeing, &c. God may be spoken of also by the qualifications eternal, universal, immutable, immense, &c. this is the same thing: eternity is a continuance of sensible duration and immensity of sensible space. Meditate as strongly and as long as you

please on these two ideas joined to the negation which seems to characterise them, and which is nothing but a supposition like those which we make on so many other questions, and you will never get beyond some material corporeal idea. But in thinking much on all the abstract ideas which tend to determine the first cause, we shall experience a singular uneasiness: we wish to express this sensation, but we can no more explain or express it than we can some undescribable morbid states of the body. It is this sensation that tempts a man to believe he has an idea of something beyond sensible objects. It is while he reflects, while he feels that he feels, that he perceives this sensation: hence it is, that he confounds it with his consciousness, and makes them inseparable. But once more, this sensation, in other respects so diversified, according to the individual, proves nothing, any more than the sensations of a hypochondriac. It may seem to some, an inspiration, and determine their belief; but to those who have studied physiology and pathology it will be an irritation of the nervous system. This sensation does not occur to every body; and although very well marked in many people, it may be dispersed by study and the observation of nature, whenever it is not brought on by disease: but it is entitled to our respect, since it is often a motive to belief and to faith: And now, let us begin again to reason, in tracing the consequences of the figurative language of which I have just given examples.

As the Rationalists make reason act like a body, let us so consider it; but in assuming this position, we have a right to express our astonishment, that they compel it to do things which no body in whose properties they clothe it, is accustomed to do; or, they give it in succession, capriciously, the attributes of other bodies, to which they had not assimilated it: or, finally, after having treated it like a body, they close by telling us it is no such thing, and has nothing in common with a body.

We cannot then conceive, that the principle which constitutes myself (*moi*) is of a nature insensible, and yet able to feel, and to take its station; which implies nerves, and an apparatus for motion; a reason which imposes laws upon things and upon men; an idea taken from a legislator, and which does not derive them from experience, as legislators do; a *moi*, which places itself as it pleases, and that insinuates, that it might please, not to place itself at all, for if it

had not the liberty of doing either the one or the other, it would have no volition; a will, a thing of which no one can have an idea, but by acting, or seeing another man act, converted into something which is not a man, and which is not even a part of a man, since it is no part of the nervous system, and which, nevertheless, has the character of man; a reason which is neither contingent nor personal, although it belongs to each human person, excepting always those who have never had the sense of vision, &c. &c. In reading all this, I cannot take it literally, without supposing it the language of idiots; if I did not know it was not so. Here then, I am convinced that these writers are well persuaded that the things they speak of, have not the material attributes which they ascribe to them. I feel myself, therefore, in an unpleasant situation, if called upon to explain how men, apparently well organised, reasoning correctly upon every thing unconnected with their doctrine, can adopt, in respect of that alone, a language of which all the expressions are false, and of a falsity infinitely diversified, and incapable of any termination. Without doubt, I could not escape from this embarrassment, any more than so many wise men who have preceded me, and who have listened with a kind of stupefaction to the unintelligible discourses of these followers of pure reason, if physiological observation had not come to my aid. I interrogate physiology then; which relieves me from an immense load, by showing that the things that these rationalists would give an account of, and which they are unable to express, are nothing more than internal sensations. From henceforward, all is explained; and I see clearly how it is, that when I converse with them, they imagine I have not well understood them. It is evident the cause is, that not having the same internal sensation, I cannot give the same meaning to words which they do. I understand these words literally; because my consciousness applies to them that meaning which is conventional among men. The rationalists give them another meaning, by making them the representatives of internal sensations which they may feel, but I do not. While we find ourselves in a situation so different, it is not likely we shall harmonize.

As to the rest, what is there strange in this, seeing these gentlemen cannot agree among themselves? And how should they agree, when by a tacit convention, each with himself, it is settled that the expressions they employ shall

not designate what they wish to represent? When they go so far as to shrug up their shoulders in pity toward those who affix to their words the usual literal meaning? However slightly the internal sensations of adepts differ from those of the eloquent rationalist who has raised them into doctrines, there will still be differences of internal sensation that must engender sects, and sub-sects indefinitely; for every one will finally perceive during the discussions, that his interlocutor has not exactly delivered what he himself endeavors to deliver.

Such are the inconveniences of words employed to designate things which neither have, or can have, any precise appropriate expression in any language. Hence, I avoid all discussion with men who have words in their mouth void of the meaning that usually and properly belongs to them, and that do not designate the things which they were invented to express. I know that by a rhetorical figure, we make words assume a meaning different from their original acceptation, and often very successfully; but, in my opinion, we ought to distinguish two kinds of metaphor. The first, founded on those resemblances which every one acknowledges; the allusion is easily comprehended, and admired in proportion as it relates to important interests. The other class of metaphors, rest upon analogies, vague, arbitrary, and perceptible, by those only who are in the habit of perverting the natural meaning of words. These last kinds of metaphor, in use among the rationalists, produce no impression but on adepts; and they are so diversified, that the eloquence of one professor is not that of another; and they are all equally unimpressive on men accustomed to severe study and strict argument.

Let us conclude: Since all the theory of the rationalists is founded on the revelations of consciousness, we may judge of them by the facts already stated, and the conclusions already deduced, in treating of the consciousness of the psychologists.

We shall not say thus much of the THEOLOGIANS, illuminated or mystic, who see every thing in God, to whom, in imagination, they are raised, by separating themselves from every thing connected with self, and with reasoning. Nothing of this kind is satisfactory to them, for it is not God. For them, the supreme good, is out of and beyond this life, in the bosom of the Deity. Such men do not condescend to

prove their belief; they recommend a patient abiding for that grace which is always imparted when perseveringly desired. They are opposed to any use of reason in explaining what they receive by faith, without troubling themselves whether reason approves or disapproves; because the principle that inspires this belief, is of a far higher nature than human reason, which is of this world, and participates of the imperfections of the world in which it takes its rise.

I have given the substance of their doctrine, to shew that although it may touch, in some points, on that of the rationalist, it has not the slightest resemblance to ours. No answer can be given to men who explain nothing, and prove nothing. I address myself, therefore, to those only who pretend to use certain explanations against the functions of the nervous system. But this last doctrine is a religion; and all religions are entitled to respect, as are their fundamental doctrines of the existence of God, and the immortality of the soul. Let any one who thinks it right, embrace those doctrines, whether in consequence of an external revelation or an internal inspiration, without pretending to found them on any demonstration which brings the nervous system upon the carpet. Physiology has nothing to do with this; for it does not pretend to prove any thing against that internal sensation, the parent of all faith, and on which all belief is founded, that is not susceptible of proof from material objects. The physiologist enumerates these sensations to distinguish them from others; and when the religionists erect themselves into ideologists, he ought, in replying to them, to put faith aside, and answer only the arguments that bear upon the subject. The arguments against the abstractions which tend to make the functions of the nervous system misunderstood, do not imply any thing like contempt for, or even doubt of religious convictions, which, in some persons, are compatible with the interior sentiment producing them; and provided he treats belief with respect, he ought to be permitted the use of all such arguments as are calculated to serve his own cause.

CHAPTER VII.—EXPOSITION OF THE RELATIONS WHICH EXIST BETWEEN THE NERVOUS APPARATUS, AND THE PHENOMENA OF INSTINCT AND INTELLECT.

We may, without difficulty, and assuredly without hypothesis, reduce all abstract substances, or entities, to func-

tional phenomena, by shewing that they are no more than the representative signs of the modifications or varieties in *perception*, which every observer remarks in himself. Modifications which sometimes associate with emotions of pleasure, or of grief, that is with the phenomena of sensibility, and which cannot be considered by our senses any thing else than modifications of the nervous system. Of these, we should know nothing, but by means of our senses for we have no abstract idea of our consciousness, as we have proved already. But we cannot undertake to treat this question here, in all its extent. We shall only, therefore, explain in this work the means of arriving at that solution of which we believe it capable: We mean a faithful exposition of the phenomena of innervation, which constitute the very basis of all our intellectual operations. Our readers will then be able to judge how near we approach to *Locke*, and how far we differ, as well as from *Cabanis*, and his illustrious scholar, *Destutt de Tracy*, whom every one ought to read and re-read before he ventures to write on the intellectual faculties. This learned man has not permitted himself to be seduced by the psychological school; but it is to be regretted, that he could not observe the animal man, in the various anomalies of pathology, and study in the anatomical and physiological amphi theatres, the connection of organized tissues with the phenomena of instinct and intelligence. To treat of these questions in their order, we shall examine in this chapter—1st How it is that cerebral perception furnishes the materials of all the instinctive and intellectual operations. 2dly How the sensible emotions become motives to our actions of all kinds. 3dly In what manner observation arising from cerebral perception develops our intellectual faculties, and what they are. 4thly, How volition and liberty connect themselves with the same perception. 5thly How intellectual perceptions associate themselves with instinctive emotions, and what constitutes the passions. 6thly What is the cause of error among the psychologists respecting the principles of action in man.

Sec. 1. *In what manner cerebral perception furnishes the materials of all our instinctive and intellectual operations.*

The encephalon considered in a full grown man, enjoying perfectly all his faculties, is placed between two currents of stimulation: Those which proceed from the external, and those which proceed from the internal nerves. *Cabanis*

first applied these to ideology, under the appellation of impressions proceeding from the organs. The stimulations which the encephalon receives from these two sources, either are accompanied, or are not so, by consciousness. We have already demonstrated, that the last mode was the first in the regular order of individual developement. We have also proved that the phenomena of consciousness, after having been developed, must necessarily experience interruptions, lest the organs upon which they depend should be over excited. At present, I have nothing to do but with cerebral stimulations accompanied by consciousness.

Cerebral stimulation, with consciousness, implies, as I have already said, the perception of some object which strikes some external sense ; and the perception also, of one's-self, as perceiving this object. This may be, as every one knows, some part of our body capable of affecting some one of our external senses, as our limbs.

These perceptions have been referred to sensibility ; which is the source of pleasure or of pain ; emotions that do not always accompany these phenomena, and therefore may give rise to objections. But these objections are nothing in themselves, for the epithet *sensible*, is applicable to every phenomenon of innervation, which is accompanied by consciousness. But to avoid every thing equivocal, I shall distinguish as before, 1st, phenomena of innervation without consciousness. 2dly, phenomena of innervation with consciousness. These last will divide themselves naturally into simple perception, instinctive or intellectual—and perception accompanied by an agreeable or disagreeable emotion : and I shall refer these different perceptions, not to particular and distinct properties, appertaining to the nervous fibre, but as different modes of excitation in the encephalon. These phenomena will be a continuation of the first mode of this excitement, wherein no one can observe either perception of self, or of any other object, or of pleasure, or of pain. Such is nervous action, in the new-formed embryo, and in asphyxy.

Perception, with consciousness, which necessarily has always a double object, is either unattended by pleasure or pain, or complicated with the one or the other of them. We shall soon see the result ; but before we go any further, let us forestal an objection, which an imperfect comprehension of what we have already said, may give rise to : Be-

cause perception has always a double object, the necessity of some single, active principle has been inferred, to perceive the one and the other of these objects ; and it is this same principle which has been distinguished from nervous matter, and declared to be of necessity, something in itself single and simple. I repeat, that this principle is nothing but a supposition ; a mere word ; the result of an induction employed to explain the *quomodo*, or *manner* of perception. We have only to renounce any inquiry into this *quomodo*, of which we know nothing, and which moreover can never be the same in all creatures possessing a brain—and leave it among the things unknown, in company with all other first causes—and this objection will be of no value : indeed we shall be compelled to this ; for we cannot avoid supposing, for the purpose of this explanation, ideas derived from those material objects which our senses have made known to us. It is, therefore, indispensable to confine ourselves to the recital of those phenomena which manifest perception, without introducing a perceptive principle ; and I propose, immediately, to give an example of this. I return to my object.

The perception of ones self, or the phenomena of *le moi*, is always the same ; although this *moi* may perceive itself in joy, or in suffering. It is not the same with that of the object which the external sense makes known : this perception becomes diversified, according as the attention remains longer fixed upon the object itself.

Objects are perceived by what is called the understanding (l' Intelligence). I mean to say, that when we perceive them in that state which you call understanding, they are perceived, 1st, according to the properties of vision, which presents ideas of colours, forms, dimensions, distance, motion, or rest, &c. 2dly, according to the properties of hearing, which furnish ideas more or less similar to the foregoing, for colours alone are peculiar to vision. 3dly, according to the properties of touch, which alone informs us of the consistence and temperature of bodies ; but which, as to dimensions, forms, motion, can only give us impressions more or less similar to those of the two former senses. 4thly and 5thly, according to the properties of smell and taste.

Such are the perceptions furnished by external objects which enter as elements among the phenomena of un-

derstanding : but we should be wrong to believe that the understanding is only composed of these perceptions, and of some active principle, which sees, judges, and combines them diversely : this manner of considering the subject, constitutes an hypothesis : it is ontology, founded like the systems we have already refuted, upon the supposition of a principle, of which man, observed by the senses, has furnished the model. But let us continue the exposition of facts.

Sec. 2. *How the emotions of sensibility become motives of all our actions.*

We have said, that perceptions were either unattended, or attended, with pleasure and pain : let us examine the first case.

In observing external objects, if the man has no feeling in himself, he is inactive ; he has no motive to react. This situation is uncommon ; but we must admit its existence, because every one feels that he has sometimes been in that situation. For the most part then, perception is attended by pleasant or unpleasant emotions ; sometimes they are so weak, as hardly to be distinguished from the perception itself : sometimes he is immediately struck with their difference : but almost always he attaches them under the relations of causality, to the different objects which have affected his senses.

Remember, that I have noticed these phenomena without supposing them executed by any entity called the principle. I wish to be understood, in advance, that if ever I make use of that word, I shall employ it only as an abbreviated formula in the discussion. The pleasant or unpleasant emotions which accompany our perceptions, proceed always from a stimulation of the nervous apparatus of the person perceiving ; and it will be wrong to distinguish them literally, into physical, and non-physical : their modes are diversified almost infinitely ; and many of these modes have been considered as particular principles, not of a nervous character, and called principles of action, or active faculties. But if you consider the facts alone, these emotions are no other than the effects of perception, excited by causes internal or external, and executed in the encephalon : and thus it is, they are capable of becoming motives to human actions. They follow also, in regular train, instinctive excitations ; void of the phenomena of intelligence ; such as those which

induce motion, in the unborn infant, and excite the action of sucking even before the child has experienced the breast, and force it to demand by cries, those things that are necessary to satisfy its first wants. In other words, the motives of action, or if you please the locomotive motions of the fœtus, of the newborn infant, of a person in profound sleep, &c. are stimulations of the encephalon, proceeding from the two sources already mentioned, but without any distinct perception or consciousness: the motives of the adult man, healthy and awake, are the same stimulations, sometimes with distinct perception or consciousness, and sometimes without. The difference arises from the nature of the acts, from habit, from distraction, &c. This will follow from the explanations into which I am about to enter.

When the man feels distinctly an internal want, in consequence of the stimulations transmitted to the brain by the nerves of the viscera, he observes all external objects in connection with this want, because the first duty of the brain is to attend to the wants of instinct. All the objects which may serve to satisfy the predominant want, cause profound emotions in the viscera where that want originates; and these emotions determine the man to execute those actions that are necessary to satisfy the want. This proves, very positively, that the brain stimulates the viscera in a state of want, by means of the perception of those external objects which are calculated to satisfy that want: the viscera rendered more irritable by this accession of stimulation re-acts more strongly on the brain. No doubt the perception of all these external objects fit to satisfy the prevailing want, excite the viscera, which respond to the stimulation. But it is quite certain that the viscus, which the existing want renders most irritable, acts most strongly on the brain, after the perception of those objects which are capable of allaying the want. The proof of all this may be seen in detail in our *physiology*.

Man always obeys the emotion which is produced by a body called for by a visceral want, unless there be some moral motive to prevent him. In early infancy he always obeys this emotion; for at that period, the want of observation, curiosity, is not yet developed. But in proportion as he becomes older, and a careful education has developed this want of observation, (curiosity) he becomes less a slave to his early wants, as we shall see in treating of volition and

of liberty. For the present, let us trace the rise and formation of the faculty of observation.

Sec. 3. *In what manner observation, offspring of cerebral perception, develops our intellectual faculties; and what are those faculties.*

When the encephalon becomes no longer tormented by wants merely instinctive, that is, when man has satisfied his wants, he applies himself to the observation of external bodies, by an emotion of a different kind from that which those wants excited. It is not easy to trace the line of original distinction between these two kinds of emotion, but the extremes are not difficult to seize.

The instinctive emotions relate to individual preservation, respiration, hunger, thirst, want of exercise, rest and sleep, want of exoneration, of generation, and the preservation of offspring. A lively pleasure attends the satisfaction of these wants; chagrin and ill temper attends the obstacles which stand in the way of satisfying them. All these emotions are excitations of the brain and nerves, with a perception of sensations more or less vivid in the principal viscera, the stomach, the heart, the lungs, the sexual organs, and vaguely in the sub-diaphragmatic nervous plexus. (see my physiology.)

The emotions which have least connection with the instinct of self preservation and reproduction, are those which are produced by external objects not calculated to satisfy these wants; and of which the phenomena are fully declared in the work already cited.* The man then, when his first and urgent wants of an instinctive character are satisfied, has another want that requires to be satisfied, viz. the want of observation, (curiosity.) This incites him to observe, to analyse his perceptions, to compare them, and to remark that he perceives himself in the act of perceiving: an act essentially inexplicable to us, and which itself constitutes the whole of his intellectual faculties.†

It is in the exercise of this kind of observation, that what are called abstract ideas arise, and which constitute the signs by means of which we represent objects under every kind of relation. Among these signs, some of them conveniently serve to recall one or other of the attributes or pro-

* We have an American translation of this valuable work.—*Transl.*

† This follows also from Hartley's theory of the association of Ideas. A book which Cabanis and Broussais would have been the wiser for studying.—*Transl.*

perties of bodies corresponding to the external senses, such as colours, consistence, &c.—that is to say, they serve to place us nearly in the same state of stimulation, as the sensible appearance of the objects themselves produced. The others retrace the circumstances in which we have seen or observed the objects; as whether they were at rest or in motion; whether they affected the senses or the viscera agreeably or disagreeably; if they satisfied our wants: if they cured a disease: if they were dangerous to health or life, &c. so that there are a great many of those signs, that are equivalent to many phrases, or even to a long dissertation, and save much circumlocution: such are the words restoration, fortification, good manners; and in medicine febrifuge, antispasmodic, and others of like kind, which designate complicated scenes of social life, or which reinstate us momentarily in nearly the same emotion, as when we felt the visceral stimulations of pain, of pleasure, of joy, of anger, of hope, &c.

It is by feeling, and by attention to his feelings and perceptions, that man judges. When the judgement he forms, is as rapid as the perception itself, it is *instinctive*, or a judgement at first view. If he does not form his judgement until by aid of memory he has recalled many intuitive judgements, which are comprised in the formula or representative signs of other judgements, they are called *judgements by deduction*, or what is vulgarly called *reasoning*. But the names are nothing: on final analysis we shall never see any thing else than the *perception of one's-self perceiving*.

If man had not the faculty of recalling perceptions passed, by means of perceptions present, (association) he would be incapable of executing all his intellectual operations: he would resemble an idiot. He could never fix his attention on any thing, if his actual perception were not thus prolonged. This faculty is founded on what has been called *The Association of Ideas*; for actual perception could not recall passed perceptions, whose cause has gone by, nor that of a third, if something did not connect the perceptions with each another. In short, *Imagination*, is but a memory which reproduces perceptions vividly and abundantly, in such a manner as to form new combination. But, let us explain ourselves so as to reduce the figurative expressions of the ideologists, to the physiology of the nervous system.

I have explained how the different judgements resolve

themselves into the *perception of the perception*. Very well. Memory, then, to whatever extent it proceeds, whether it has for its object, bodies, or their properties, or their circumstances, or emotions, is nothing more than the actual perception of past perceptions, recalled and reproduced. There is, therefore, but one phenomenon of the understanding; that is, perception. What we know positively concerning it, is—1st, That it takes place in the brain. 2dly, That it is an excitation of the substance of the brain. I refuse to say that it is an effect or result of the excitation of the substance of the brain. I say, that it is the excitation itself, of the substance of the brain, in one of its various modes of being excited. I add, also, that an idea* can be nothing else. Diseases of the encephalon, prove this in a manner incontestible; they furnish direct and positive experience that the words *sensations, perceptions, ideas*, cannot represent to the physiologist any thing but nervous matter, under some of its modes of excitation. They put these phenomena on the same line with volition or the will, about which I shall have something to say.

Sec. 4. *How the will, and the freedom of the will, connect themselves with perception.*

If sensations, perceptions, ideas, and volitions, change with the varieties in the mode of excitation of the nervous matter of the encephalon, it follows that they must depend upon it; for you cannot make them depend upon any other principle without introducing some hypothesis, founded upon an inadmissible comparison: the *quomodo*, the manner alone of this causality, how it takes place, is, and must remain, unknown.

The will, moreover, is one of those phenomena which have been most insisted upon, to render the brain subordin-

*That a *sensation*, or impression, on some of the nerves of sense, external or internal, transmitted to the brain; and its counterpart, an *idea*, that is a recollected sensation, are no other than similar motions excited in the brain, and there felt or perceived, may be considered as the opinions of the most eminent physiologists.

See Haller's *Primæ Linææ*, § 556, Edinb. 1767.

Bichat. *Phys. Res.* Dr. Watkins' edit. Philad. 1800, p. 105, *prope finem*.

Richerand's *Phys.* Dr. Chapman's edit. 1813, Philad. p. 390, 392 and 400.

Blumenbach's *Phys.* Dr. Caldwell's edit. Philad. 1795, vol. 1, p. 195.

Majendie's *Phys.* Dr. Revere's edit. Baltimore, 1822, p. 102, 103.

Nil unquam fuit in intellectu quod non prius erat in sensu, is an axiom true at this day, as well as in the days of Aristotle, taking the word *sensu* to designate as it ought, the internal as well as external senses.—*Transl.*

ate to some principle, or entity,* not nervous. But let us quit for an instant the personification of this phenomenon, to study it, not metaphysically, but physiologically.

In the embryo, and in many diseases, it shares the lot of all the other phenomena of intelligence; it does not exist at all: this is the first proof, that it emanates from the brain. It augments and it diminishes in conformity with the excitation of the encephalic substance: this is the second proof, that it resolves itself into a mode of action of that substance. The will, as well as perceptions and ideas, is shackled, forced, conquered, obscured, denaturalized, in the strangest manner, by the stimulations by which the viscera, particularly the digestive and reproductive, under certain states of excitement, affect the encephalon. This is the third confirmation of the two precedent ones. I refer to my treatise on physiology on this subject. The *quomodo*, the manner how, rests at present among the things unknown.

The question of the freedom of the will, is connected with the will itself. It is asked, are we free, or are we forced on by something that governs us?

It is necessary to determine what extension is intended to be given to this expression, freedom of the will; for there are certain kinds of freedom or liberty, which belong to us, only upon certain conditions. Such are those that relate to the actions we perform with our respiratory muscles. The psychologist believes himself at liberty to speak: he is so, so long only as the want of respiration permits him—if a fit of the asthma should come upon him, or a violent nausea, the muscles of the voice are no longer at his disposal. A pregnant woman believes herself at liberty to walk during nine months; but when labor approaches, the muscles of progression must be otherwise employed in aiding the contractions of the uterus. A man seized upon by the desire of sleep, has neither the power of walking nor of thinking at his disposal; his limbs feel heavy, and his eye-lids close, in spite of himself; he can no longer keep his thoughts fixed upon one object; it escapes from him; his ideas become deranged, and the labor of resistance on the part of his will, gives rise to a crowd of phantoms, in the midst of which, he goes to sleep profoundly; that is, he loses entirely, every intellectual operation; so, whenever some excitation be-

*The soul of the metaphysicians, or psychologists; of Stahl; the *Archæus* of Paracelsus and Van Helmont.—*Transl.*

yond what is usual and regular, becomes developed in the tissues of our viscera, we begin to lose something of this freedom : first we are deprived of some of our powers of action, and then of some of our powers of thinking ; we see this, not only in violent fevers, but also in the chronic phlegmasiæ of those organs which are abundantly supplied with nerves, and which exert a lively stimulation on the brain. The same thing is also observed in the idiopathic irritation of that organ. It cannot do every thing at once. When the viscera torment it, it loses its aptitude for thought ; or else the irritation which it receives, forces its ideas in a particular direction, so dependent upon the disease, that this forced direction of thought increases, diminishes, and returns with the disease. I shall be answered, " Since these are diseases, they form exceptions." There are no exception. The diseases, in this case, are no other than modifications of the organs of thought ; and our word, " freedom," is only applicable to certain states of the organ.

But what idea can we have of this freedom of the will, when the encephalon is not over excited, either sympathetically or idiopathically ? This is a delicate question : we undoubtedly have the consciousness that we are free. This consciousness, however, proves nothing, for an idiot has it also, although he is governed by a morbid irritation. The fact is, that we always have a motive for action, and the instinctive wants of self-conservation and re-production, frequently concur with the internal motive of curiosity which leads us to remark and observation, in directing our thoughts and our actions. The weakness of the brain, its imperfect developement in the part which executes intellectual operations, the habit early contracted of obeying visceral impressions and impulsions, or in resisting them for the purpose of acting as our understanding dictates, decide without our knowledge on all our actions, even when we suppose ourselves most free. Our habits of thinking, which depend either on the organization of our brain, or on some predominance of action which chance forces us to give to this or that region of the cerebral organ, or if you please to this or that mode of excitation in its fibres, are causes which determine our actions, and therefore our thoughts ; and compel us to execute what habit dictates while we fancy ourselves at perfect freedom.* Now and then, man awakes from this

* Our *sensations* and their reminiscences, *ideas* ; all our *thoughts*, are

lethargy ; he sees the tyrants that deprive him of liberty ; he revolts, and determines to make resistance in the most pressing emergency. In so doing, he obeys sometimes a religious, sometimes a selfish motive. For instance, for the sake of saying " I am free," he obeys the wish to enjoy his own esteem and that of his fellow-men ; a wish not less imperious than any other whatever, but which cannot take place, or influence his conduct, if the encephalon be not developed, and exercised in a certain manner.

Often we resist one instinctive want by another. Thus, hunger will yield to love, or to parental affection ; the fear of death often yields to this instinct, or even to self-love ; and this last gives way to some other passion, &c. In all these cases the struggle takes place in the encephalon ; and physiologically it is nothing else than some of the varieties of excitation.

Such is the real account of freedom of the will (*liberum arbitrium*) ; it is a form of expression and nothing more, designating a certain kind of excitement that takes place in the brain, inciting to action in the voluntary muscles. In considering this subject, we must banish the personified, abstract entity, and consider only the facts ; for if this entity be placed in our consciousness, and we do not submit it to the verification of our senses, we shall be compelled to admit on equal footing, the mental freedom of the sick, and of the idiot, with that of the healthy man of perfect faculties ; for the idiot also says, " my will is free." This must be the case unless you admit two kinds of free will, one for the healthy and one for the insane ; and such a supposition will conduct us to two kinds of souls, unless we refuse to assign this incorporeal director to the insane, or suppose it inactive, a stranger to the phenomena over which it presided yesterday, and may be called on to preside to-morrow.

Sec. 5. *How intellectual perceptions associate themselves with instinctive emotions ; and what constitutes the passions.*

In all cases where the perceptions termed moral, that is to say, those that are not connected with our first wants, but

stimulations that take place in the brain, according to fixed laws of the animal economy and the established properties of that organ. The things and circumstances that give rise to sensations, ideas and thoughts, are out of our power. The laws that regulate their occurrence and their effects upon our brain, are out of our power. The laws that regulate the results of their action upon us, our consequent actions, are out of our power.—

Transl.

with curiosity only, do not excite lively emotions, the man acts but feebly : if he had no other motive he would remain inactive ; but nature has provided for this. As we proceed in the career of life, these perceptions become connected (associated) by recollections with our first wants which originally did not affect them ; in course of time there is hardly an object completely estranged from them. The sight of a table recalls hunger ; the sight of a cup, thirst. An agreeable shade recalls a country passed over ; and the recollection of it, awakens the rural appetite ; the sight of a flower, or some article proper to make ornamental dress, recalls the pleasures we have enjoyed with a beloved object. A precipice recalls the danger we may have run ; weapons, the combat we may have sustained ; the victory or the defeat that followed, with all their emotions, &c.*

These relations take place by means of *the association of ideas* ; and when their effects do not excite hunger or thirst, or any thing relating to individual conservation or reproduction, they at least awaken certain other thoughts founded on feelings, or emotions ; or they excite us to the contemplation of ourselves, attended with a sentiment of approbation or satisfied self-love. Hence it is, that among the poor, these associations almost always relate to emotions respecting the satisfying of primary wants, or to their children, and leave always something to be wished for ; while among the rich, the learned, the poet, the artist, they close in some object of self-love ; an insatiable passion which disguises itself in a vast number of shapes, each of an insidious character, but which we cannot stop to explain in this work. Among benevolent persons, and among ascetics, the series of thoughts, excited into action by an object apparently the most insignificant, are connected with emotions of compassion, or the enjoyment of a heavenly life, or the torments of a state of punishment. The philanthropist is conducted by the same path to that kind of emotion which is peculiar to him ; and among them all, the idea of resistance or obstruction calls up painful emotions connected with fear or with anger.

These are facts which no person is ignorant of, and I do not state them for the purpose of giving information to any body, but to warn those who are strangers to physiology

* All these are clear cases of the association of ideas so admirably explained by Hartley.—*Transl.*

and pathology, that all these emotions take place in the same organs, and that none of them are disconnected with the nervous tissue. The brain, in all these cases, excites internal nerves; and the nerves which are distributed through the same viscera from whence proceed the sensations of hunger, of thirst, the want of respiration, or excretion, are excited together with those viscera; and sometimes they are excited even more vividly than in the highest degree of these wants, by the feelings of self-love irritated or satisfied, by pride, haughtiness, or violence humiliated, compassion, sorrow, despair, anger, fanaticism, cruelty, indignation against crime, admiration for virtue, religious anger, compunction, religious ecstasy, enthusiasm of any kind; in a word, by all those emotions which are ranked as moral, moral sentiments, and principles of action purely intellectual, &c. &c. We may then affirm, after observation made by means of our senses, on our own bodies and those of others, that all these associated emotions excited by external objects, are, and can be, none other than organic;* and that it is not possible to insulate them from the nerves of which they are modifications, any more than it is possible to insulate the contraction of a muscle from the fibrine of which it is a modification.

It is in this character, that the emotions in question are completely within the jurisdiction of physiology in respect of their nature, though they may be connected with pathology as to their cause, or with hygiene with respect to sanitary precautions. They belong also to the moralist, the publicist, or the legislator from the influence they exert on social happiness; but to the psychologist they are strangers; nor can he usurp any cognizance of them, but through the hypothetic comparison whose artifice I have already explained, and which hereafter will serve him in no stead.

All these emotions which resolve themselves into pleasure and pain, constitute the basis of the passions, which are those durable desires or aversions by which we regulate our conduct. The term and state called *passion*, implies two things: 1st, a series of ideas which occupy us principally, and by which we regulate all the others: 2dly, emotions which connect themselves with these ideas, and which are recalled by, or recall them unceasingly: all to satisfy some or other of our instinctive wants, or our curiosity, that is,

* This is demonstrated by Hartley.—*Transl.*

the wants created by the feeling of the desire of observation. Without visceral emotions somewhat vivid, man has nothing but tastes, tendencies, inclinations; but *with* vivid emotions he has passions. Two causes destroy or greatly enfeeble the passions: 1st, one or more series of ideas different from those which sustain them: that is to say, another system of conduct dictated by observation and reflection, or imposed by chance or by force. 2dly, The diminution or cessation of those emotions which give rise to the passions in us; for example, that of love by a change in the organ where these emotions are perceived.

The passions of instinctive origin are more difficult to eradicate in certain conditions of man than the intellectual; but it is not so in other conditions. Men whose brains are well developed, correct or conceal their dominant appetites, and vice versa. Very often the passions founded on instinct, change their object in consequence of being modified by the intellect, without ceasing however to be based on instinct. It is thus that the desire for some one woman may be converted into a passion for all, or libertinage; the passion for certain articles of food or drink, into gluttony or drunkenness; or the one and the other of these may put on the form of epicurism. I will not stop at details: each series of ideas is accompanied with sensations which become habits, when we are compelled to act upon them for a long time; and we thus contract factitious tastes which among men of lively emotions are apt to degenerate into passions. It is upon this fact, so well known but so seldom reflected on, that a good education ought in great part to be founded; but it is not my object to discuss this question: I shall be content to state it, because it is connected with medicine and the laws of health; which ought to be well acquainted with the nature of man, that they may point out the kind of intellectual and muscular exercise which are fitted for certain diseased states of the nervous system.

Sec. 7. *Cause of the error of the psychologists upon the principle of action in man.*

One may judge on these data, how great is the error of the psychologists, when they assume as principles of action independent of the nervous apparatus, any of those emotions which have their rise in the brain, acting during thought upon the nervous system of the viscera. But they notice a small number only (on which they have not had the pre-

caution to agree) while these assumed principles of action are really innumerable. They multiply with civilization, with the progress of the arts, with ornamental literature : but the real sciences, tend rather to confine their number than create new varieties. Hence it is, that psychology which is no science, but a play of the imagination somewhat like poetry, ceases not and never will cease to multiply them.

Psychologists may take their course : the observation of what passes in nature will bring all things to rights. The kind of stupor which some high-sounding words, pronounced with emphasis, have produced among the naturalists, who are employed in the examination of facts—words such as *grandeur of conception, sublimity of view, large, profound, extended*, in opposition to *narrow considerations, littleness of conception, absurdity* and what is worse, *ridiculous*, may for some time prevent the observers of man from comparing and concluding. The fear of passing for a man of mean spirit, is very powerful with some : fears from a very different cause have acted upon others ; but all have silently observed and collected the facts which are unknown to the psychologists ; and some have not been restrained by diffidence or timidity, from the intention of publishing them. Metaphorical expressions borrowed from material objects, of which the senses only can give us any idea, are not calculated to serve the purpose of the psychologists in painting their ontological conceptions. However lofty the eminence on which these geniuses place themselves to domineer over the human race—whatever *extent* they may give to the horizon which their view can take in from that *sublime* point—however *profound* the abyss placed beneath them—however *long or wide* the road traced through the plain which their sight would pass over—still all this is matter ; and matter much inferior to that which constitutes the brain of a man. These figures of speech are not calculated to raise our nature, to aggrandize our conceptions, or to enable us to discover objects further than our sight really empowers us. The great or the little emotion which the poetic psychologist feels in dealing out these pompous images, proves nothing but the excitation of his own nervous system. His consciousness tells him that he experiences emotions, and no one has a right to contradict him : but the proof amounts to nothing but this, and this changes nothing

in the real nature of the facts. Man is a more noble being than any other sensible object to which you can compare him. Employ a metaphor if you please, but you must offer it for what it is, and you must without anger permit us to reduce it to what it actually represents, and to what the senses attest. The fundamental point is to characterise these facts truly, for after all, we must come to the bottom of the question. Every expression which when fairly examined resolves itself into the man himself, under some of the modifications to which the human system is liable, ought not to be regarded as relating to a distinct entity, or being separate from man.

CHAPTER VII.—HOW THE INSTINCTIVE AND INTELLECTUAL PHENOMENA ARE CONNECTED WITH IRRITATION.

To treat this question accurately, we must take the instinctive and intellectual faculties, as they are now reduced or converted from separate and distinct entities existing in and by themselves, into phenomena observable by consciousness acting in concert with the senses; and shew that these phenomena, are in fact no more than a healthy, normal, and regular stimulation of the nervose-encephalic apparatus. When they are thus reduced, or converted, we shall see clearly how these same phenomena are attached to nervous irritation; for this is nothing more than unusual, abnormal increase of stimulation in the nervous system; a state, of which the opposite is abexcitation or defect of stimulation. This reduction or conversion, can be made without recurring to any hypothesis: and here is the general fact which we lay down as the foundation whereon to erect our theory of instinctive and intellectual phenomena, of which we have already explained the nature.

What we call attention, perception of external objects, perception of our own thought or consciousness, idea, judgement, reasoning, memory, are not specific faculties, separate entities inhabiting the brain, put into action by the impressions that proceed from the senses, or by some pretended internal force independent of them, as has been asserted of *le moi*, or of consciousness, and of the memory—they are no other than varieties of cerebral perception, which we may observe as facts or phenomena, but which we cannot venture to explain. Still less are we permitted to adopt the poetry of metaphysics, and to personify these varieties

or modifications, for the purpose of explaining the superiority of one over the rest, or the influence they exercise one over another, as active principles ; for we cannot do this without treating these phenomena as if they were bodies cognizable by the senses, with which in fact they have nothing to do, for they can resemble nothing but themselves. All this we have already proved : let us now connect these phenomena still more closely to the nervous system.

The phenomena of perception are double : as to their origin, they are, 1st, effects of excitation that takes place in the external senses ; 2dly, effects of excitation that has taken place in the internal senses, or within the interior of the tissues. Results of the excitation of the nerves, they are themselves excitations of the encephalon, reacting on the same nerves in some manner or other ; and their existence is of itself full proof of encephalic excitation. The one makes us acquainted with external objects, the other with the internal state and affections of the human body : but for perception, or consciousness to take place, the encephalic apparatus is indispensable in both cases.

It is impossible to conceive (at least in respect to their origin) that perceptions can be independent of these two classes of nerves : no facts exist to prove it : whereas their reproduction by the mere excitation of the encephalon, is a fact undeniable. Every mode of encephalic excitation that has existed, may be renewed in the absence of the cause that first and originally produced it ; and one mode may call up another ; this is memory and the connection (association) of perceptions : the one and the other may take place under all modes of perception.

Perceptions produced by the excitation of the nerves of external senses, are more or less clear, and are tied to the object which determines them. In this point of view they are called ideas. An idea then, is an excitation in the brain associated in its origin with a stimulation of some external sense. Such is the fact : how, this comes to pass, is beyond human comprehension : still the fact is the same ; and it is true also, that this excitation in the brain, being there reproduced by any cause whatever, different from the original object, the idea of this object never fails to arise, and we seem to see or hear it ; while the mere stimulation of the sensitive organ without the brain to react upon it produces nothing. Hypochondria and insanity furnish proofs enough of

the first assertion, and the profound sleep of apoplexy of the second.

Although the idea cannot be personified, that is, considered insulated by and in itself, either as an impression made on the brain, or as an image painted on its substance, or as an entity of any kind resulting from this personification, yet it is always characterised to the person perceiving it, as some material object or as some property of such an object, or as the mark and sign conventionally substituted for such object or its properties. This mark or sign, is sometimes in likeness of a figure, sometimes of a sound, or less distinctly with the three other senses: in short, when the objects are absent, we experience a sort of illusion like the internal representation of some simple object, or some scenes which we have witnessed. This is precisely the proof that the idea* is nothing more than a stimulation of the brain; which may be replaced by the mere excitation of its tissue, in the same state of stimulation or excitation, which was before occasioned by the object, acting on the senses and by them produced in the brain. No idea (of any external object) can exist, but by means of a stimulation made on some external sense. There is then, in the interior of the brain, a sense corresponding to these kinds of stimulation only; as there is externally a sense corresponding exclusively to certain agents, essentially and by their nature stimulating, and it is always according to one and the same law that this is effected. Hence the impossibility of giving ideas to those in whom this internal sense is not yet developed; and hence the difficulty or facility, the clearness or the confusion of ideas, &c. corresponding to the perfect or imperfect developement of this internal sense. The perceived impressions produced on the brain by the stimulated viscera, exciting reaction, are at first confused: but after some time and in proportion as life advances, they associate themselves with those perceptions that arise from the senses; and if they do not produce ideas peculiar to themselves, they recall by association those ideas which the senses originate, and which properly speaking are the only ideas that can arise. Does this difference proceed from the nerves of the interior, not communicating directly with the internal sense of ideas, or that the stimulation they transmit to the encephalon, has no connection with internal sense?

* By Idea here he means what Hartley calls a sensation: viz. the original impression.—*Transl.*

No doubt both causes contribute to this: for on the one hand every sensible surface, whether internal or external, has its own peculiar organization; on the other hand it is not possible to believe that the stimulations proceeding from the viscera, and which shake so powerfully the encephalic apparatus, and so imperiously carry with them the will, approach the cerebral substance at the same point and with the same delicacy, as those which proceed from the external senses and which furnish our ideas. The stimulations that proceed from our external senses and those that proceed from our internal, differ then in the following particulars. 1st, In respect of the organization of the nervous expansions which furnish them. 2dly, With respect to the region of the brain in which they respectively take place. 3dly, With respect to the intensity which they possess when they arrive. 4thly, With respect to the manner in which they agitate the encephalic mass. We are at a loss for accurate facts on these different points, but we possess a few data. We know, for instance, and have long known, 1st, the portion of the brain where all the nerves that enter it are inserted. 2dly, That the central base of the brain and the whole of the cerebellum are principally devoted to nutritive and instinctive functions: comparative anatomy throws much light on this part of physiology as well as on the following, 3dly, that the hemispheres of the brain constitute that enlargement which is connected with predominance of intellect. 4thly, That the anterior part of the brain contributes most powerfully to intellect, and therefore is the seat of the most delicate portion of our senses and ideas. The cranioscopists are occupied incessantly in collecting facts, which tend to particularise the seat of each series of ideas and each instinctive impulse; but this labor is as yet very far from its termination.

What are called *appetites* are perceptions proceeding from visceral stimulations, transmitted to the brain, and attended with pleasurable or painful sensations: for the external senses alone, afford but few sensations. These emotions constitute *instinct*: they precede ideas, but never fail to become associated with them: without this, the appetites would never be satisfied, though they should stand but in little need of complicated acts.

The appetites of the psychologists are synonymous with our instinctive wants: but we prefer the term *wants* to designate those phenomena, because it applies to the desires

of exoneration, of exercise, of repose, of sleep, of individual conservation, all of which are on the same line with the appetites of nutrition, reproduction, respiration, heat, cold, &c. Every man who experiences a want, feels pleasure or pain; and all artificial pains resolve themselves into wants. Thus it is that the skin, exposed to superabundant caloric, feels the want of cold; a wound, a contortion, &c. the want of ease from pain. But such is the character of wants, that the viscera partake of them more or less; that is, we suffer or we enjoy in the splanchnic apparatus and more especially near the centre, upon every occasion when we feel a want well characterised.

So soon as the body which is calculated to satisfy the want, is in contact with the external senses, the want which was vague before, becomes now distinct and precise; the act is executed by cerebral innervation as we have already seen, if some moral cause does not oppose it. What I would particularly remark on this occasion is, the association that takes place between the agreeable or disagreeable perception of the want, with the idea of the body that satisfies it. This association may commence at birth, or even before, by the impressions made on the skin of the fœtus, or by the feeling of uneasiness that accompanies certain attitudes of the body, and compels motions to take place in consequence. Be it as it may, these first ideas are too obtuse, too little compared with others, for consciousness to notice them afterward. They remain like those of the deaf and blind by birth, in whom the objects give no knowledge of their like. But in proportion as the cerebral sense of ideas becomes enlarged, as the external senses become developed, and ideas multiply, association becomes extended, and the emotions that occupy us, finally connected with the idea of a body, become motives of all those actions whose end is the satisfaction of instinctive wants, relating either to self conservation or reproduction.

In time the connection becomes so strong between the objects that strike the senses and the emotions that take their rise in the viscera, that all these emotions recall sensible ideas and vice versa: but when the internal emotions become too multiplied, the objects of sense are not sufficiently numerous to furnish each of them with an idea. Hence the same idea becomes associated with several shades

of internal perception, agreeable and disagreeable, that is to say, with emotions but in a manner very variable, according to the nature of each.

One would hardly believe that the number of emotions could surpass those of ideas, but on a little reflection it will be impossible to doubt this. In the beginning of life, the preponderance is evidently in favor of emotions, as appears from the multiplied and generally fruitless efforts of the infant, during all the time that he is endeavoring to acquire the knowledge of words; that is, to associate his emotions with those ideas of which persons are teaching him the signs. The adult, healthy and quiet, the peasant, the savage, do not seem to wish for more expressions than they are acquainted with; but let some passion agitate them, they will torment themselves to express all the shades of it; they will produce a hundred times over the same expressions in different combinations; till satisfied of the impossibility of expressing all their feelings, they will complain of the poverty of language, that is, of the small number of ideas known to their fellow-men and to which they have associated sensible signs. This kind of embarrassment appears in the letters of lovers, in the works of all poets, and all writers of impassioned prose. It is this paucity of ideas that compels them to have recourse to transpositions of the sense, and to metaphors, of which I have indicated the conveniences and inconveniences before. Nevertheless, this is nothing to be compared to the abundance of the metaphysicians; they surpass in figures of speech, all lovers, all orators, the most impassioned, and all poets the most inspired; not only because, like them, they would express all their emotions, but because, also, they are determined to express the why and the wherefore. A barrier ought to stop them; I mean, the number of clear, intelligible ideas. But, hurried away by the passion of discovery, they soon break through; and whenever they begin to forget that metaphors are nothing more than forms of words—whenever they give themselves the license to transform words into things—a new world, as they say themselves, opens to their view. In truth, this world to them is vast, for the objects that fill it, are all the signs of things in this; each with twenty significations, different from those that we assign to them, and with the possibility of receiving as many more as the caprice of these new creators may see fit.

It is by no means in the spirit of criticism, but in compliance with reality, that I place all the hypochondriacs, and all the neuropathics, who border upon insanity, by the side of the metaphysicians: both classes, in fact, find themselves under the necessity of torturing the sense of words; but it is the metaphysicians only, who voluntarily put themselves in this situation.

What we call desires, are nothing more than perceptions, accompanied with pleasure or pain, but which deduce their origin from stimulations made upon the senses, and the ideas that thence result.

Desires show themselves while man gives himself up to the impulse of curiosity, which becomes developed with the faculty of having ideas. But as the pleasure, or pain of desire, cannot become intense without the brain, of which it is only one mode of excitation, stimulating the viscera, the emotions of appetite soon join themselves to desires; or rather, the appetites furnish to desires a new degree of activity, by adding visceral to cerebral excitation.

Desires have been separated from appetites, because they have a different origin, and an object more elevated. One cannot help applauding this distinction, even when applying it to certain appetites best characterised. However little mixture there is of desire for intellectual enjoyment with the appetite for sensual enjoyment, it is well to choose an expression which draws the curtain over this last idea; for it is intelligence that elevates man above animals. It is for this reason that the modern word *gourmandise*, is objectionable. In what grade of civilization would you place a man, who solicited the hand of a young lady, from parents grave and sedate, in telling them that he had an *appetite* for the attractions of their daughter? He manifests to them the *desire* he has of passing his life with her, because he is charmed with her grace, her intelligence, her good disposition, &c. We should substitute, as much as possible in our intercourse, the expression of desire to that of appetite, which seems rather to place us in the rank of animals, and has, moreover, an expression in it of selfishness. These kinds of distinctions are conducive to social order; but the physiologist ought not to forget, that while desire implies no more than a mere wish for intellectual enjoyment, which the faculty of observation procures for us, it can only consist in slight emotions, and that by consequence whenever

desires manifest themselves by a forcible expression, there is something more than simple desire ; there is truly appetite, or rather, physical want, and it is thus that the passions are formed ; but they commence in two manners, sometimes by simple desire, to which appetite joins itself, and sometimes appetite is the occasion of developing the desire.

The desire arising from the instinct of observation, (curiosity) according to what we have advanced, ought to belong to the brain. Appetite always proceeds from an excitation of some of the other viscera ; but as perception implies that this excitation is repeated in the brain, one may say, that desire and appetite have this organ in common, and that they are excited and sustained by its means.

It is thus that excitation passes and repasses incessantly from instinct to intellect, and from intellect to instinct. This is to be sure, speaking figuratively, but I use it to prevent long explanations. Suppressing however this form of speaking, the following facts will always remain, which the senses and the consciousness of the observer may simultaneously verify : 1st, the other viscera stimulated by causes foreign to the brain, excite this viscus instinctively and intellectually ; and it reacts upon them. 2dly, the brain, stimulated intellectually, excites the other viscera instinctively, which react upon the brain : all with different shades of pain or pleasure.

It is this reciprocity of influence of instinct upon intellect and vice versa, which when prolonged, constitute the *passions*. We have in fact found there an instinctive want soliciting the intellect, which is incessantly labouring to find out the means of satisfying it. It is so in love, in gourmandise, in drunkenness ; passions instinctive in their origin, of which the indulgence calculated by a subservient intellect, furnishes so many depraved and degrading tastes and habits. This is indeed the shameful agreement of the flesh and the spirit, becoming a system of conduct.

It will be attempted in vain to refute this explanation by urging that there are passions purely intellectual. The most intellectual are those that have for their origin self love, or the pleasure a man receives on contemplating himself in comparison with other men ; a kind of pleasure that he manifestly owes to the remarks excited by his instinctive curiosity. Such are pride, ambition, love of power, of riches, of honors, of academic crowns, of eulogies collected at the

tribunes, of the esteem of honest men, vanity, emulation, respect of our fellow men, the point of honor, envy, jealousy, &c., passions where we see nothing but varieties of a common sentiment or feeling. This sentiment is the want we experience of self-satisfaction, or the want of those internal emotions which are agreeable to us, or aversion for those of an opposite character.

It is true that an attempt has been made to erect the sentiments that predominate in our passions, into so many distinct principles of action, constituting them distinct entities *sui generis*, and destined to put man into action : but these entities have no peculiar privileges over those which we have already prostrated. The physiologist can see nothing in an agreeable or painful emotion which serves as a pivot to the passion, or as the motive to action in man, but some form of excitation of the nervous system ; and the more nearly we observe men, the more shall we be convinced, that these motives owe their power over the will, to the part acted by the viscera. In fact, self love, when satisfied, occasions joyful emotions ; if wounded, sorrowful ones, which are soon followed by anger. But these three sensations, whose origin is in the encephalon, are constantly followed by a stimulation of the visceral nerves, which being transmitted again instantly to the encephalon, is the secret power which produces decision and determines our actions.

Sometimes, it may be said, we have as a secret motive, the prospect of future enjoyment, or the wish to escape from some imminent pain : but the one idea,* is actually agreeable, and the other, actually painful ; which in fact makes the motive the same as in the preceding case, when you reflect on it physiologically. In whatever manner you turn the question round, a full investigation will always produce this alternative, viz : we give way to an instinctive want, or to an intellectual want : and in those cases where the latter is sufficiently strong, to prevent our giving way to the former, it owes this superiority to its producing an excitation in the same viscera, whence the instinctive want arises ; an excitation of a different nature from its own.

* Broussais uses the word *idea* ambiguously : sometimes for the perceived impression of an external object ; and sometimes for an internal sensation. Hartley uses *sensation* for the first, and *idea* for the recurrence of a similar stimulation by memory or association. Hartley was not aware of the extent of visceral sensations and associations.—*Transl.*

The excitation wherein consists the calculation or internal debate, always takes place in the encephalon ; every idea is successively produced ; and that which produces the strongest visceral agitation determines the act. Hence it is, that men differ so much in their tastes, their propensities, their passions, according as they are carried away by such or such a predominant organic appetite, or that they give themselves up habitually, to this or that class of emotions. Tastes alter as the state of the viscera alter. Those of digestion and generation provoke a train of ideas which it is impossible to repel. The heart and the lungs excite others. In chronic diseases also, the character changes ; but in general, we may lay it down as a principle, that the more the encephalon is developed in those parts assigned as the seat of intellect, and the more energy a man bestows on that region of the brain, by the culture of his moral faculties, the more habitually will he obey the emotions that proceed from the desire of observation, (curiosity) and the less is he enslaved by the emotions of conservation and reproduction.

But this culture of the intellect, may bring on a crowd of artificial passions. By despising instinctive movements, man abandons himself to spiritualism, and pays no attention to realities : he reduces himself by fastings and by watchings ; he imposes upon himself painful attitudes ; he tears his flesh ; and subjects himself to torture to propitiate a divinity of his own creation. In other cases, we see man braving death, to obey either a secret motive of self love, an enthusiastic patriotism, filial affection, or some other distinct passion. He becomes enamoured, sometimes of one form of government, sometimes of another ; and he does not always keep himself within proper bounds : he embraces, by a kind of moral contagion, founded on the emotions which he experiences, sometimes the part of an orator ; sometimes of a poet, a philosopher, or of an actor ; and he becomes transported with hatred and with anger, against those who do not agree with him in opinion. What excites him more particularly, is the supposed interest of religion, and above all, the certainty of eternal happiness according to his wishes and his habits. It is for this reason that the followers of Mahomet are the most fanatic of the human race ; and, are the most disposed to acts of atrocity, to obtain from the divinity some kind of happiness, of which they have framed to themselves an idea.

All the artificial passions are fed partly by a certain train of ideas, which chance has rendered permanent, and partly by emotions of the nervous system, pleasant or unpleasant. These emotions are always the same ; they are those which our first wants create ; and they are rendered more intense, when they are left unsatisfied. They are at the service of all those trains of ideas, which governments succeed in imposing upon the multitude, who have not the liberty of cultivating their intellects as they please : for wherever there is liberty of investigation, and liberty of the press, the observation of nature will, sooner or later, lead men on the road to truth.

The roads that lead to truth are not chimerical, for they have as their basis, the organization of man, and the nature of the objects that summoned him. With freedom of instruction, and freedom of the press, no error can long prevail ; for he who has best used his talent for observation, will necessarily obtain the assent of all persons well organized. There will be, to be sure, partial obstacles, generally local, arising from literary bodies, from coteries, from persons in public credit, from orators, &c. But what are all these obstacles, compared to time ? Men, in whom these illusory trains of ideas have acquired too much influence over their nervous system, to permit them to yield, or who believe their honor interested to be unbending, will disappear, without intellectual posterity of their own description, while the cause of liberty and the sciences, continues to progress. In proportion as this takes place, poetical and oratorical language loses its literal signification : they are insensibly reduced to a metaphorical jargon, a kind of hieroglyphic, whose proper interpretation constitutes part of the education of youth, in a well governed state ; and this is true logic. This language has intruded itself among the sciences, from whence it ought to be banished. Chemistry and Natural Philosophy were the first to execute justice upon it. Medicine is becoming freed from it, by her connexion with physiology : *general philosophy is still infected with it ; but we are touching upon the time when it will be gotten rid of, by giving up the theory of the human intellect to physiology, and by explaining frankly according to the real fact, the forms of expression it is compelled to employ, instead of presenting them mysteriously, as so many distinct and separate beings.*

This question is strongly connected with our subject; for the type of intellectual excitation, or the degree of that excitation which least disturbs the nervous system, is that which corresponds to the truth: in other words, that which a man ought chiefly to guard against in the exercise of his intellectual faculties, whether in respect of his health, or the moral consequences of his actions, are those excitations of his brain which are determined by the contemplation of, or the search after illusions.

Among the passions of intellectual origin, one of the most illusory of them, avarice, occupies a distinguished rank: the fear of wanting the necessities of life, seems to constitute the fundamental sentiment of this passion: then comes a love of money; the representative sign of all the enjoyments of life; the desire of amassing it, and the continual fear of losing it. Sentiments which induce the avaricious man to commit actions so mean, that their ridiculous character escapes nobody but the miser himself.

Avarice belongs to the nature of man; for it is only prudence pushed to excess in the means of providing for the necessities of life. There are many kinds of avarice; as many as there are of instinctive and intellectual wants. One man is avaricious of his wine, another of his houses or dogs, another of his books, his medals, or any source of self gratification. But the avaricious man properly so called, differs from the rest, in being in a state of intellectual derangement, in such a way that the possession of the sign becomes of itself a substitute for all the enjoyments which that sign can procure. Remark too, that it takes a considerable time for this illusion to become confirmed; that is, for all other ideas to be merged in the possession of the sign of wealth. But while the avaritious man is hurried on by this secret propensity, and gives himself up without perceiving it to this species of Ontology, his force decreases; he feels that the means of acquiring are about to leave him; fear, which is the foundation of avarice, increases daily, and ends by being carried to its extreme degree. Hence poets and artists who would represent avarice in excess, always choose as models, meagre old men, whose appearance gives the idea of sneaking caution, and apprehension. Although a depressing passion, it has its periods of violent reaction and even of rage, after which this passion refalls into the habit of fear which belongs to it, now and then interrupted by bursts of

anger. We place it among the disturbing exciters of the nervous system, which tend to increase excitement into irritation.

These researches into the nervous excitations which become motives to our actions, naturally lead us to the *WILL*, considered also as a nervous excitement tending to irritation.

What we mean by *the will*, is a mode or manner of encephalic excitation, in consequence of other modes of excitement termed perceptions, and of others also called emotions. It is characterised to the person who experiences it within himself by a perception of consciousness, and to a stranger by muscular motion. What proves that the will is truly a mode of cerebral excitation is, that 1st, whenever this cerebral excitation is increased, so is the will. 2dly, When one is diminished, so is the other. 3dly, Whenever the excitation of the brain, is interrupted or shackled by a quantity of fluid that stops its movements, the will disappears together with all the modes of perception and emotion belonging to cerebral excitation. Nothing then remains but the instinctive mode of the same excitation in its obscurest shade, in that which permits nothing but the perception of the want of breathing, and the reaction of the brain which transmits innervation to the respiratory muscles. If for the purpose of objection, any one should connect this perception and this reaction of the lowest scale of instinct with intellectual perceptions and the will, this would be for us another reason for seeing nothing in the will but an encephalic excitation. There is no occasion for thus approaching it in order to embrace this view of the subject; the facts themselves compel it. But we must not make the impossibility of explaining the fact an objection to the existence of the fact itself. The labours of many physiologists of the present day, tend, with more or less success, to connect with certain regions of the encephalon, the different modes of excitation of which I have just spoken; as well as the following.

Muscular action is always, during life, the effect of the excitation of nervous matter, upon the fibrine of which the muscles are composed; but, as we have already seen, the encephalon does not always intervene; it has the direct government of the motions of the respiratory, locomotive, and vocal muscles: but it controuls, indirectly only, the ac-

tion of the muscles of the viscera, by transmitting excitation throughout the whole nervous system, and furnishing it to the nerves belonging to those muscles. Hence it is, that when it is greatly excited, there is a surplus of contractility throughout all the muscles of the body ; hence convulsions in the voluntary muscles ; spasm, and convulsive oscillations in the visceral muscles ; and then the will being overpowered, is compelled to transmit a surplus of innervation to the muscles under its command, or else it disappears by excess of irritation, to give place to a morbid, instinctive excitation of the brain, which determines the motion of these muscles, either with, or without convulsions. These phenomena may depend on the too active influence of other viscera upon the brain, without having been excited by the will ; but very often, also, they show themselves by intellectual stimulation, in the more violent and active passions ; in anger, and at the moment when the will, which has brought them into play, seems to have most intensity. This is, as if we should say that the cerebral excitation to which we give the name of will, disappears by its own excess, when carried too far ; but it is not alone in this condition : all the other modes of excitation, considered as intellectual, become more or less depraved, and annihilated through the same cause, as we shall see in treating of insanity and its consequences.

This imports that none of the intellectual faculties can manifest themselves but within certain limits of cerebral excitation ; beyond those limits, this excitation produces nothing but delirium, and actions which we are accustomed to refer to instinctive movements of the most brutal description : below them, the intellectual phenomena of the person observed diminish in intensity, cease to correspond with those of the person observing, lose themselves in idiocy, or become mingled with the most simple instinctive acts, or disappear, leaving nothing but these behind. This is what the progress of old age insensibly brings on, if disease does not produce this state of things prematurely.

Such are the phenomena of nervous action, considered under almost all its varieties and shades ; nor is it difficult to bring under the same point of view, those which have not been particularly designated. It is thus that we ought to consider nervous action, and not in a general manner, or by erecting it into one or more distinct entities, or personified

abstractions. It is in the manner I have now indicated, that moralists, legislators, and physiologists, may determine the limits which separate their respective occupations. For myself, whose principle object here, is to lay a solid basis for the doctrine of irritation, I shall add only a few words more on the phenomena of nervous excitation, considered in itself.

On nervous excitation, considered in itself.

What is there of a material nature, that passes into the nerves, and into the brain, to enable them to execute their functions, independent of the molecular affinities, which support the nerves and the brain with all their known properties? It is here, as I have already said, that the great mystery of the economy of life resides; for the first impulsion which puts into action the vital forces, is to be found in the half liquid animal matter which constitutes the nervous system, and of which the neurilema of the nerves, the membranes of the encephalon, and the dermoid covering of the membranes of relation, are nothing more than the vehicles, or if you please, the vessels and the support. Here it is, that we are stopped; here it is, that none of our senses can penetrate; it is here, in this albuminous substance, that the unknown cause of life, of instinct, and of intellect, connects itself with our system; but remember, that in the adult, this connection is effectuated on the membranes of relation, all of which are sensitive surfaces; and that the most essential of these relations take place upon the surface of the mucous membrane. This is a fact of great importance for the physiological physician, inasmuch as it leads him to conclude that the nervous matter which is intermingled, (no one knows how,) in these tissues with the sanguineous matter, is one of the principal means of conservation, and ought, by consequence, to be considered as one of the principal causes of disease and of death. When excitation is too vivid in these seats of internal sensation, especially in the two great passages of relation constituted of these materials, viz. the internal bronchial surface, and that of the stomach, one may distinguish in them a redness accompanied by a greater warmth than usual, owing to an excitation beyond the normal limits.

We cannot make observations on excitation in the imperceptible canals of the neurilema, through which it passes in following the nervous pulp to arrive at the brain from the

surfaces of relation, to return to the muscles, and to pass from one of the viscera to another, &c. The motions that take place in these circumstances, we have not been able to observe by means of any instrument: it is, however, an object well worth pursuing. But if our senses cannot distinguish this kind of motion, we are in possession of an anatomical fact that enables us to draw conclusions. When a nerve has caused considerable pain, and produced many convulsions during life, when in short it has performed its functions not in an ordinary but an extraordinary manner, we find the neurilemma injected with blood, or lymph, and sometimes ossified: and the nervous ganglions are red and tumefied more than ordinarily in the dead bodies of persons whose nerves they surround, and which have been for a long time subject to supernormal innervation. From these facts, we may conclude, that the inflammation of the nervous substance properly so called, is accompanied with inflammation of the sanguineous capillaries and the lymphatics, which subserve to the nutriment of the neurilemma and aid the functions of the nerve.

The changes produced by excitation are more easy to be seized in the substance of the encephalon. It is within the purview of our senses, that this substance reddens, becomes injected with blood, and heated in a remarkable manner when it acts with remarkable energy, whether in the phenomena of thought, or in that kind of innervation on which muscular action depends. The atrophy which it may suffer after hypertrophy, is common to all hypertrophies and evidently produced by excitation, and which confirms rather than weakens this proposition.

All these facts establish the coincidence between sanguineous and nervous excitation. But we know that alternations of contraction and relaxation exist in the excitation of vessels of whatever kind: we may, therefore, assume that this belongs to all kinds of excitation in the nervous apparatus; and we may assume this the more safely, as we know that the nerves and the encephalon can act but for a short time without the aid of the circulating blood. The nervous substance, however, possesses an action peculiarly its own; what is that action?

We have already shewn that the encephalon yields and returns upon itself in the direction of the white fibres: here then is a powerful datum in favour of an oscillatory move-

ment, when the nervous substance is excited, independent of the contractility of the vessels and the cellular membranous laminae which penetrate it, surround it, embrace it, sustain it, and which cannot but oscillate and become agitated with it. We shall find this fact again in the history of insanity.

Whether any thing else takes place than these contractile agitations in the phenomena of nervous excitation; whether caloric, electricity, or any other imponderable fluid modifies or supports life, otherwise than by putting in play this contractility in the nervous substance, and the fluid molecules in contact with it, we know not even how to conjecture. It is possible that on this earliest stage of life, phenomena of affinities, transformations of the fluid essential to the nervous substance, if there be any such nervous fluid, may take place, as does in fact take place in the blood which traverses it to supply nourishment and means of action: but it is far wiser to stop than to frame conjectures and hypotheses on this first cause of innervation. Although in the phenomena of consciousness, nervous excitation perceives itself acting, it is by no means likely that it can perceive also its relation with the first governing cause of all things. This kind of knowledge has not yet been obtained from any observation of nature, and it is not likely to be obtained from physiology. We may presume this, 1st, because to the present day man has never perceived any thing but material bodies and their properties—bodies which are not himself. 2dly, that his perception of bodies is confined to such as his external senses can take cognizance of. 3dly, because his perception of his own viscera is confused; and he has no ideas of them but such as are formed from the observations made by his external senses. 4thly, because the perception of his own thought is reduced to a single fact which he can neither multiply or fecundate; for beyond the assertion, *I perceive that I perceive, (or I feel that I feel)* he has not one other assertion to make on the subject, which does not belong to the perceptions he has received, by the senses situated on the surface of his body.

CHAPTER VIII.—ON THE PART WHICH EXCITATION ACTS IN THE PRODUCTION OF DISEASE.

Having described the phenomena of excitation, such as we conceive them to be, and such as others ought to con-

sider them who study by aid of their senses, we are led to ascertain how this excitation may deviate from its usual and natural (normal) state and become abnormal or diseased.

Excitation becomes weaker with time, so that life would cease if new stimulants did not come perpetually to renew excitation. Hence, beyond doubt, the maladies of debility, numerous enough, but which Brown and his followers have singularly exaggerated and multiplied. To indicate the origin of these maladies, is to put ourselves on the road of discovery for those of an opposite character.

Sec. 1st. *How defect of excitation produces abirritative diseases.*

We have already seen that there are two excitants, whose absence would speedily bring on destruction, oxygen for the lungs, and caloric of temperature or free caloric for the skin. Recalling what has been explained on nervous excitation, we shall be aware that these two excitants exercise their first action on the surfaces of relation, and that it is thence rapidly conducted along the nerves to the brain, which transmits it by other nerves* throughout the system. Nor must we lose sight of the introduction of oxygen into the blood, and perhaps of the penetration and progression of caloric or some other imponderable substance into the capillary canals of the nervous system.† With the aid of these

* Every organ of the living body, be it large or small, executes its own peculiar functions, and not those appropriated to any other organ. Two distinct functions are never performed by one and the same organ. Each has its own business and duty. Thus, every stimulation that excites to muscular action for any purpose whatever, may be termed a motive, or a volition. This may originate in the ganglionic system of nerves; but if it be not sudden and instinctive, and nevertheless requires the aid of the voluntary muscles, it must be first propagated to the cerebral center. In every nervous fasciculus communicating with the brain, however small, there is *one* nerve destined to indicate the state of the internal viscera, and transmit to the brain stimulations that take place in the ganglionic system, and *another* that transmits from the brain nervous stimulation to the muscles of voluntary motion to excite them into the required action. This has been proved by direct experiment, by *Bell*, and *Majendie*, and confirmed by the cases of *Mr. Broughton*. See *Johnson's Med. and Chir. Review*, No. 29, for July, 1787, p. 200. See also the review of *Descot*, in the number for Ap. 1827, p. 425. The same opinion is adopted by *M. M. Torres, Manec, Martin, &c.—Transl.*

† I find in the number of the *Globe*, of Ap. 1828, while correcting the proof this page, that *M. Dutrochet* has made experiments of which the result is, that there exists in the living body an *intra-capillary electricity*, to which the movement of the bodily fluids is to be ascribed.

The contact of the liquids electrises the solids, and the organic sensibility of the living solids is nothing more than the property of receiving

recollections, the observer may frame to himself an idea, of the deficiency which will arise in the sum or amount of

intra-capillary electricity, which is the real agent of the vegetative, or organic life. These experiments according to M. Dutrochet, will also prove that the solids and the liquids have one and the same property, to wit: the capillary electric, which he terms *activity*; a word which must take the place of *sensibility*, which is consigned exclusively to the psychologists.

During a long time past, organic sensibility has been reduced to irritability of the fibre—its property of contracting under the influence of stimulants: we have long known that electricity determines muscular contraction, and it would be easy to suppose that it acts equally on other forms of animal matter. We have expressed this opinion in the text. But whether irritability be brought into play by one agent or another, the question remains the same. The electricity communicated by the fluids to the solids, must be an electricity modified by the state of life, and not by the principal agent of the organic life. Suppose it to give an impulse in the living capillaries, this may be conceived, if we allow at the same time that it is modified by the state of life, as well as the attraction of masses, caloric, and the molecular affinities of which we find traces in living bodies: for we may presume that no one will attribute to this new electricity of M. Dutrochet, all the transformations of living matter, the appropriations of certain molecules to certain tissues, the rejection of others, the manner, the duration, and the measure of development of all the forms of animal matter that compose the living body, &c. Since neither common chemistry, nor caloric, that excellent excitant of all nature, can explain the phenomena of vegetative or organic life, it is not likely that intercapillary electrization will prove more successful. Should the experiments of M. Dutrochet be confirmed, we can only assert in that case of electricity what we dare not yet assert of it; that it is now shewn to figure among the instruments of life, as has long ago been asserted of all the other natural phenomena observed among living beings. But one common fact will always remain to all these phenomena; viz. that neither one or another of them can be regarded as the regulator of vegetative or organic life; for the moment it predominates over the others in a living body, life will be destroyed. Life is an unknown modification of all the phenomena of nature which our senses make known to us, and doubtless of others also whereof we can have no idea; it is not one or the other of these exclusively. Although we cannot say what it is, we can observe, and arrange in some regular order the appearances it presents, as we discover them. In this work an attempt has been made to pursue this method in arranging the phenomena of contractility and innervation, in order to arrive at the knowledge of irritation; that is, the disturbances produced in the animal economy by those agents, which render the phenomena of life more or less strongly marked than they are in their regular normal state.

As to the complaisance with which certain physicians have lately proposed to abandon sensibility to the psychologists, it is founded no doubt on the belief they entertain that this phenomenon is still considered as a property of nervous matter. But the idea first entertained by Vic d' Azir to rank it among the functions, has been since fortified by too great a number of proofs not to be generally adopted, and to leave no hold for the spiritualists. See also the explanations on this subject in the first chapter, and in the chapter preceding this.

excitation, when these two excitants come to be wanting to the animal economy, and the difficulty which nutrition will experience in keeping up all the tissues, and particularly the nervous, in that state of vigor which the exercise of their functions require. In fact, the oxygen which the blood absorbs by means of the lungs, is the cause of the temperature peculiar to animals, that is to say, furnishes them with caloric internally. But moreover, they require to be excited externally by free caloric, or at least that the media by which they are surrounded, have caloric enough not to absorb too rapidly that portion which the body disengages while discharging its functions. We may then say, that excitability is only kept up by means of these two agents : that it languishes so soon as their influence diminishes, and it becomes extinguished when that influence disappears entirely. Man in this case dies without having lost any of his substance ; he has lost nothing but the aptitude of living, that is the aptitude of being excited. Such are asphyxies from want of respirable air, from hanging (and drowning) wherein man loses nothing but oxygen ; but in drowning he loses also his caloric ; so also in death by excessive cold of the atmosphere, which depends on the too rapid subtraction of caloric without defect of oxygen.

After the deprivation of this double source of excitement, comes that of the aliments ; but the want of nourishment is less urgent than the want of caloric ; for a man may accumulate blood and other fluids that may serve the purposes of nutrition for a while ; but he cannot thus accumulate caloric in the solids and the fluids, without danger of life. At all times the excitation which these aliments and beverage exercise on the digestive organs, being among the means by which excitability is supported, as well as the vital energy of the human creature during his extra-uterine life, if their aid fails, changes take place in the animal economy which lead to disease. To the languor of the vital forces, is added the uneasiness resulting from the privation of a necessary stimulant, and irritation joins itself to the diminution of nutritive materials, to hurry on death accompanied by dreadful suffering.

The blood and other humors, produced by digestion, are, as we have seen, the natural excitants of the internal tissues which these fluids pervade. We may remember that this excitation is the only one which supports the functions of

the fœtus, not yet habituated to external stimulants, and this is enough to shew its importance. The subtraction of blood and the other humors, like the subtraction of food, diminishes excitation, and many of the morbid states that depend upon it. If this subtraction be rapid, nature revolts, and irritation takes place, as in the diseases produced by hunger, but in a somewhat different way. The most horrible convulsions precede the last hour of those who die of hemorrhage, if we do not begin by diminishing or destroying their excitability. It is for the purpose of preventing these convulsions, that butchers knock down by a blow on the head, the animals, before they bleed them. The violent stimulation exercised on the brain, by the viscera, deprived suddenly of the blood necessary to their functions, seems to depend on the same general law, viz. that all our wants, those of addition and repletion, as well as those of exoneration, make their appeal to the encephalon by the phenomenon of excitation. In other words, not figurative, wherever nervous matter is in want of its regular normal excitants, it contracts, if it be living an irregular abnormal mode of excitation, which is propagated along the nervous cords to the encephalon. In all these cases, death, for want of normal excitement, is brought on by irregular abnormal excitement; and while certain organs are in this state of negative excitation, (abexcitation) such as the limbs, the organs of the sense, and the viscera of the second rank, the organs of the first importance expend the remains of their vitality in exaggerated innervation. Such is the law, and we ought carefully to bear it in mind; for we find it among the sick, who are frequently bled, and among those who submit to want of food, for the sake of conquering an obstinate inflammation. To be ignorant of this, is to injure the sick, and to prepare for ignorance and charlatanism, a triumph which they never fail to abuse.

The slow, but continual subtraction of circulating fluids, brings on debility and death without reaction. Animals treated by narcotics, can also support hemorrhage, even to the extinction of life, without reaction or convulsions.

In general, we may say that the excitations just now stated, being the only ones indispensable to the support of human life, nothing but their subtraction can bring on direct languor and debility. But man is always subject to another kind of excitement, of which the privation may become ex-

tremely painful : I mean the excitation he receives in his external senses, by the view of nature, and the relations he necessarily bears to all other living beings, especially his fellow creatures, during the exercise of his several functions. In fact, as we have already said, it is in seeking nourishment, in trying to escape the influence of heat and of cold, in avoiding the causes of destruction that menace him on all sides, in performing the several acts of reproduction and conservation of himself and his offspring, that man receives moral excitations, and converts them into a habit and a want.

The modifications of intellect, though infinitely varied in their sources and their shades, are resolved, as we have seen, into an excitation of the nerves and the senses transmitted to the brain, and thence reflected upon all the moveable tissues of the animal economy. This excitation then, proceeds and joins others produced by other causes, and modifies them more or less ; that is to say, it influences the distribution of the fluids, their temperature, their assimilation, nutrition, muscular motion, &c. &c. Nevertheless, its principal action is in the nervous system, which contracts a habit to such a degree, that the want of this excitation produces a state of languor, which may be the cause of a diseased state of the system, wherein we always trace the presence of irritation ; and this is the necessary result of that reaction which the subtraction of excitants produces, in subjects who have not been previously deprived of irritability. Let us now see how this subtraction of various stimulants can produce diseases of irritation.

Sec. 2. How the defect of excitation produces irritative disease.

We have already said that man cannot live but by means of excitation, but this, whatever be the cause, has a tendency to become weak after a certain time ; so that life would inevitably be extinguished, if new stimulations were not applied continually to renew and keep up excitation. Such is the general fact, applicable to all excitations. The extinction of life does not always take place with the same promptitude. That depends on the kind and importance of the excitants whose absence menaces life. The subtraction of oxygen produces directly and quickly an extinction of excitability and by consequence of excitation. No reaction can take place here, because reaction is founded on excitability which cannot be kept up without oxygen : but in a

great number of other cases this reaction is displayed, and produces diseases of irritation consecutive on sedation* or secondary, which we did but slightly touch upon in treating of diseases produced by direct debility.

The subtraction of external caloric when complete and rapid, produces death like the privation of oxygen accompanied by great cold. But if the caloric be subtracted incompletely and in a moderate degree, and the respiration still remains perfect, excitability is not destroyed but rather augmented; while reaction developes in the skin, or some other organ in its neighbourhood, an excitation beyond the normal degree and which amounts to irritation. Hence arise the inflammations of the skin, such as chilblains, acute rheumatisms, colds, and all those phlegmasiæ which are the morbid consequence of cold applied to the external surface of the body. Remember that the fluids flowing always to the place where excitation calls for them, having no principal of action of their own,† abandon the skin when cold has relaxed its activity, and when return of reaction has produced any inflammation in the part; or they accumulate anywhere internally where irritation takes place in consequence of reaction. Cold also produces pain, hemorrhages, augmentations of secretion, effusions of serosity, &c. which we cannot refer to any other vital modification than reactive excitation converted into irritation.

This consequence is forced upon us, because cold acts only on irritability; and irritability presides over all the sensations, over all motions of the body, and over all displacements of the fluids.

The subtraction of nutritious food and drink, leaves the stomach without excitation: but if irritability be not previously destroyed, and if the cerebral functions can yet exert themselves, the change produced by this privation of alimentary excitement in the stomach, is perceived; and innervation takes place in the stomach and in all the organs

* The want of action from want of excitants and excitations. The effect of the class of medicines called sedatives.—*Transl.*

† If they had, they would go where that principle guided them, and not where nutrition calls for them. They can have no principle of action other than the affinities which connect their molecules with those of the solids: but as these affinities can only take place in the narrowest canals, the fluids forming a mass are soft, and are directed mechanically by the action of the heart and arteries and veins, and by the pressure of the air; powers to which it is latterly proposed to add *Endosmose* or inter-capillary electricity. See the last note of the author.

charged with primary or incipient assimilation ; the excitation they experience becomes converted into irritation, the fluids are summoned thither, and if hunger long continues, inflammation seizes on the digestive organs, and more or less on the principal viscera ; while the external parts grow meagre, and are only animated by sympathetic pains and convulsions : the man gives way under excess of suffering to the disorganization of his viscera, long before his fat is exhausted, or the surplus of his circulating fluids consumed, or any other of the materials which nature seems to have placed in reserve to supply the defect of nutriment. Hence you may observe, that the greater the force and the irritability of the system, the less resistance can the man make to the imperious demand for food.

The irritation that takes place in the stomach, deprived of food, is suspected to depend on the continually increasing progress of animalization, an effect of the chemistry of life, which begins to operate on the alimentary ingesta in the stomach, and which finishes by placing in the solids the animalized molecules. Whether the gastric irritation of hungry persons depends on this cause, or on the increased acidity of the digestive juices, on the increase of innervation from the internal sense of the stomach on the brain, or on the conjunction of all these causes, still it exists : to a certain point it is allayed by water. On the other hand, though the want of water is more intolerable than the want of solid food, on account of the internal heat that accompanies thirst, I have heard several sailors who had been exposed to suffering from thirst in the Pacific, say, that they could not have preserved life, but by consenting to eat, notwithstanding the thirst that afflicted them. They declared that all their companions who were unable to overcome the repugnance to food, died miserably. Hence we may conclude, that however stimulant alimentary substances may be, as in this case were biscuit and salt meat, they acted as sedatives on the gastric membrane over excited by hunger. These sailors declared that they felt refreshed by the solid nutriment. Still we may conceive that this refreshing sensation can reach only to a certain degree, and if the want of water had not ceased, these men would have been reduced to the inability of swallowing solid food, however strong the desire to take it might be. Perhaps those who fell victims were already reduced to this inability. Moreover, this

over-excitation, from want of food, may be as easily conceived, as that which arises from want of sleep; but it is not easy to explain either the one or the other. It is of the nature of any viscus that is deprived of its natural modifier, to stimulate the brain, and provoke it to those acts which are required to supply the want, and from stimulation to irritation, the step is easy. But there is an exception to be noticed here, relating to very old, very thin, very weak persons, whose irritability is in great part exhausted. Such persons, not being able to react, fall a sacrifice in a short time, by the direct operation of the want of food.

What we have said respecting the death of robust persons, shows that the want of nourishment is seldom of itself a cause of death. In fact, by aid of certain drinks, proper to retard inflammatory action in the digestive organs, a man may live without solid food, even until he has consumed the stock of nutriment in reserve distributed through his body, and till he has reached the last stage of marasmus; this continues a long time, when the person is not exposed to fatiguing exercise. This is a most valuable privilege for our species in the social state, and that ought to afford comfort to persons who are prohibited from food on account of disease, or from any accidental cause.

The other external excitants, to whose action we are exposed, ought to be regarded as factitious, and are not absolutely necessary to our existence. They tend only to keep up the equilibrium, and their subtraction cannot produce irritation. In fact, independently of all original want, we assume the habit of being excited in some certain manner, and in some certain organs: we find pleasure in this, and then a factitious want is created. If the excitations that these enjoyments give rise to, should be wanting, we feel restlessness and uneasiness; the well-marked desire of experiencing our usual stimulations shews itself. This desire may of itself increase and be exalted into irritation, situated in the brain and viscera. This irritation is produced by a moral cause; but the defect of our habitual excitations may affect us in another manner. We allude to those cases where such excitations induce the evacuation of a fluid of some kind. This fluid being no longer directed to its usual emunctory, becomes a burthen upon the animal economy, and if nature does not direct it to its regular and normal course of discharge, such as cutaneous perspiration, urine,

&c. it excites in the organic tissue an extraordinary irritation, which becomes a real disease.

In our opinion, we may regard these as the chief causes of those irritative diseases which depend on defect of excitement.

Let us now proceed to investigate those which are produced directly by excitation.

Sec. 3. *How excess of excitation produces diseases of irritation, and what those diseases are.*

We repeat once more, that excitement will become extinguished, if it be not kept up by stimulants. We now add, that to maintain an equilibrium, it is necessary that new stimulants should not be applied to the nervous portion of the several organs, until the excitation of those which have preceded, has been reduced down to a certain point: This point is not easy to be determined; it varies according to individual constitution, and according to the habitude and the degree of the excitants or stimulants. If excitation be too often renewed, if it be always applied, before that which has preceded it be sufficiently weakened, or if it be provoked by agents of uncommon activity, it no longer becomes of itself gradually weaker, until it falls into a regular normal type; but it continues; and although the organ be removed from the action of the stimulants that have provoked this new irritation, it exceeds its normal type, and puts on the character of irritation. In all these cases, excitation travels on with great rapidity in nervous matter: it is propagated from one visceral centre to another, always receiving a fresh impulse at the place most excited: it attracts and accumulates the fluids in all the tissues where it predominates, and tends to denaturalize the phenomena of calorification, secretion, exhalation, and nutrition, as we shall soon see.*

The proofs of this assertion are abundant, and obvious to all observers. We need only remark some of the most striking, and which may be referred to the different organic apparatus. An atmosphere too oxygenated, excites the lungs more strongly in proportion as they are at the time

* See *Examen des doctrines médicales*, 1816, p. 439, where the following passage may be found under the head *physiology of irritations*:—"When a stimulant acts on our organs, the nerves receive the impression. This irritating impression being received in the nervous system, the course it takes is this: either it remains there and produces morbid phenomena, neuroses; or it operates on the sanguineous capillary system, and determines therein phlegmasiæ; or it operates on the non-sanguineous capillaries, secretory or excretory, exhalant or absorbent, and gives rise to those numberless alterations of which I have before spoken."

more exciteable, and there produces inflammation. Food excites the stomach during a certain time: but if by new supplies of food we are resolved to expose that organ to new excitements, before the last digestion is sufficiently weakened, the stomach undergoes an excitement, which is not weakened in the usual and normal manner, it becomes irritation: at first this is merely nervous, and is dissipated by the passage of the ingesta, or by other stimulants: but if this overloading be persevered in, the irritation becomes sufficiently strong to produce an unnatural accumulation of fluids.* The lapse of time necessary to produce this over excitation, varies according to the more or less stimulating quality of the meats and drink, and according to the power in the individual of establishing an equilibrium of normal excitation: but whether it require a week or several years, still, over eating and indulgence in intoxicating liquors, is sure to bring on gastritis more or less nervous, and accompanied always by a morbid alteration in the tissues irritated. Certain substances exceedingly exciting, such as strong alcohol, acrid and corrosive poisons, &c. require only an instant to produce this irritation in the stomach; in like manner certain deleterious gases can produce an over irritation in the respiratory organs, in the twinkling of an eye. If the natural excitants of our organs of sense, the eyes, the ears, the nostrils, the mouth, the skin, are too powerful, the apparatus exposed to their action suffers in consequence; but if you suspend the stimulation, the excitation produced will decrease, and the equilibrium will be soon re-established: but if the stimulation be incessantly repeated before this equilibrium be restored, the sensitive apparatus will be irritated, will become disordered, and often within a shade of the disorganization of the part. Those who have long misused their eyes are in this case. The ear is not irritated but by sounds extremely loud; but the nose and the mouth are often irritated by sternutatories and sialagogues: as to the skin, any one may verify our statements by using frictions or topical irritants.

In all intellectual operations, it is the brain that acts. Allow it rest after exertion, and you may enjoy with impunity the pleasures of study. But if you keep on forcing it, either by continued study, or by yielding to the movements

* Hence heart-burn, chronic gastric inflammation, or sub-inflammation, that is, dyspepsia.—*Transl.*

of the passions, and compel it to new exertions before the first has settled down to a normal state, the stimulation becomes excessive, irritation is produced, and the delicate medullary tissue of this organ becomes exposed to serious alterations by the extraordinary afflux of fluids to the part, and the deviations from the nutritive affinities. This organ is one in which it is singularly difficult to re-establish the normal type of its organic action, because it is the boundary of all the lively stimulations which take place on the surfaces of relation, both of the external and internal tissues; it is no wonder then that the maladies which depend on cerebral irritation are so common. Megrim, lunacies, convulsions, paralyse, apoplexies, are the chief; all acknowledging irritation as their cause, but not always induced by the irregular exercise of the intellect or affections: the stimulation of the stomach is a frequent source, in consequence of the sympathy of the organs of thought with those of digestion.

We have been too long ignorant that the heart compelled to beat with supernormal activity by violent exercise, by moral affections, and by the inflammations produced by fever, ends by contracting an irritation which is sufficient to alter its tissue, and conduct it by hypertrophy, to the state of aneurism. Intellectual labour pushed too far, passions violent and more especially long continued, giving no rest to innervation, or time to return to a normal state, engender every day a state of irritation whose principal seat is in the nervous apparatus of the three visceral cavities; for it is thus (as we shall see) irritation has different predominant localities, as well as different degrees of intensity. It is easy to apply to the organs of generation, the secretory organs, and the muscles, the observations we have just made on the principal visceral apparatus, considered as liable to the influence of excitants.

This second source of disease, (excess of excitation converted into irritation) is more fruitful than the first (defect of excitation) and is indeed the source whence far the greater part of our maladies flow. Writers may assert, generally, that over exercise of our organs fatigues them, and that the body long exposed to these rough proofs is used up and worn out. But in saying this they express the result only, without affording any notion of the physiological changes that produce it. This process is excitation, and the modification of it that destroys us, is in every case irritation.

It is to this irritation we must refer a crowd of diseases, which have been attributed to vicious humours, or to virus; such as scrofula, ring-worms, &c. and those which arise from the agency of contagion and infection. In fact, how do these maladies differ from those whose causes we have indicated? Certainly in the nature of the irritating agent only. In our most usual irritative affections, the agents are those which keep up our existence. They are in fault only by being in excess or in defect. But let them undergo an alteration in their constituent principles, let them be deteriorated by fermentation, putrefaction, or loaded with foreign deleterious principles, and we shall see them converted into true poisons: in that case, they are upon the same footing with every other substance in nature, not destined for our nourishment or our sustenance, in the regular and usual manner. Nevertheless, what effect have all these poisons but to produce irregular abnormal excitations, and without requiring repeated or prolonged action, to convert them into an irritation capable of wearing out the nervous power, producing a collapse, or determining active congestions in the principal viscera? It is said they affect the humours of the body; but during life this is a chimera. All that can truly be said hereon, is that the humours of the body may serve as vehicles to them during a longer or shorter time: but this virus, these poisons will produce no disease till they produce an irritation in the solids. This is proved, inasmuch as the animal economy may become habituated to such of them as are not poisonous in a very high degree, or do not corrode the tissues: for the molecules of these poisons circulate in our vessels without injury for an indeterminate time without any renewal of those irritations which their contact heretofore produced in the solids: such are putrid miasmata of moderate activity, and those of a much more active character, belonging to the plague, the yellow fever, the small pox, &c. As to those poisons whose activity is such, that life is incompatible with their presence, they can make no attack but by irritating the organs and destroying them, as strong acids and alkalies do when injected into the vessels; or in causing by too rapid an excitement a loss in the nervous matter, of that excitability to which our existence is attached: such are the gases which exhale from certain burying places, and whose first inhalation is suddenly fatal. Our opinion is, that of the known poisons, none of them are directly sedative of

nervous excitability : and we will demonstrate it by some detailed observations which cannot find a place here, but which will be decisive. At present we can only give a bare idea of this. Whenever the most formidable among the poisons act in a small dose, upon some tissue actively alive, they over excite that tissue ; this is a fact of experience. Can we then conclude, that when they kill suddenly, when applied in quantity, that they produce this effect in any other manner than by rapidly consuming the excitability of the more delicate tissues ? Of those tissues in our economy which are most vibratory, in those where all the movements of the animal machine commence, of those on which our existence depends, in a word on the nervous tissues ? These reflections are made to awaken our curiosity to the manner in which irritation acts when it once establishes itself in our organs. It is to this investigation we are now proceeding, in order to complete the general history of this interesting phenomenon.

Sec. 4. *Of the changes that take place in the organs, in consequence of Irritation.*

The irritated tissues assume more rapid motions than in their normal state. They summon to the irritated part, the fluids, in consequence of the affinity that takes place between the fluids and the solids, and which is stronger as the power of life is more intense. They form what are called *diseased vital erections*, (*erections vitales morbides*) which in their turn produce changes in the mode of existence of the tissues themselves. The first and chief, is the *inflammatory state*. The irritated part swells, becomes penetrated with blood, and red : caloric is disengaged more than usual, and the local temperature is increased. The part is threatened by disorganization ; but as inflammation may assume a variety of shades, so may the disorganization consequent upon it. When inflammation has produced an excessive congestion, gangrene or death of the tissue ensues, and putrefaction takes place before it be detached from the living parts ; oftener it is suppuration ; at other times is a hard, red, inflamed place. These three terminations generally render the part affected unfit for its destined uses ; it separates entirely, or it becomes soft, dissolves, and the solid molecules of which it consisted are re-absorbed : that is, are carried away by the stream of circulation that is perpetually passing through the part in question, and of course they dis-

appear from the organization. This destruction may be complete or incomplete ; in the latter case the part that experiences a phlegmonous inflammation, may still perform its functions.

In certain cases, the inflammation, either in respect of its duration, or in respect of the organization of the diseased tissue, loses part of its activity, and becomes chronic. There are some inflammations, which establish in the parts they attack, a kind of abnormal nutrition, which covers the part with vegetations : indeed we may say, that before it produces the destruction of an organ, inflammation always begins, by determining to that organ a certain degree of hypertrophy : but this hypertrophy disappears, whenever the inflammation becomes rapid ; and it never makes a great progress unless in those inflammations whose moderate intensity allows them to continue a long time.

Inflammation which has not produced disintegration of the tissues, often causes them in its decline, to contract abnormal adhesions ; and produces deformities in the tissues, more or less considerable, without having occasioned a real disorganization. It produces these alterations, by transforming the lymphatic molecules which it has evaporated at the surface of inflamed tissues, into solids. It is thus that it consolidates wounds, and establishes durable adhesions between surfaces that were previously unconnected, or that rubbed against, or slid over each other. The pleura, the pericardium, the peritoneum, are the most usual seats of these adhesions ; but they may be formed in any situation where two inflamed surfaces come in contact. We take advantage of this disposition to adhesion in our organs, to cure some original deformities, such as the hair-lip : it suffices for this purpose, to make the two living surfaces bloody, by cutting through the lip, setting the edges free, and then keeping them in contact. The inflammation that takes place, produces an adhesion which lasts through life.

It is by means of inflammation, that irritation produces the most astonishing effects. As yet we have but briefly touched upon those which take place in the part where inflammation is developed ; by-and-bye, we shall examine the consequences. Our business at present, is to enquire into what passes in other organs, in consequence of the inflammation of any one of them.

Slight inflammations affect that part only where they are seated, and very often the individual is not sensible of their presence. A man in a fit of apoplexy does not feel the blister you apply to his skin ; the inflammations excited in a paralytic limb are seldom felt ; several deep seated inflammations in a part containing few nerves, in a subject of dull sensibility, run their course without any painful sensation giving evidence of their presence.

Pain, accurately speaking, is not among the number of local phenomena, that are essential to inflammation. Indeed, how should it be, for sensibility is a function of the brain ? Pain, therefore, must be ranked among the extralocal phenomena which depend on transmitted irritation. The nerves, agents of all irritative communication, conductors of all stimulation, transmit irritation to the brain when it is violent in an inflamed part. Hence, pain is the valuable exponent which completes the diagnosis of inflammation ; and we may see how important this sign is, when it becomes necessary to pronounce on inflammation in some hidden organ, where redness is not visible, where increase of heat, not distinguishable by the touch, can only be referred to pain, and where tumefaction is hard to be ascertained.

But here, the history of inflammation becomes complicated and obscure to a degree, that requires on the part of the physician efforts of attention, of reasoning, and of induction, which prevented this phenomenon from being fully understood and appreciated by the ancients. So soon as inflammation or phlegmasia (synonymous expressions) is considerable, whether from its activity, its extent, or from its violently affecting the brain, this cerebral irritation affects also a crowd of other organs, which in return transmit to the brain their own irritations. Hence, proceed a great variety of painful sensations, and motions more or less unpleasant and disordered ; the first mover in this tumultuous assemblage, inflammation, is often lost sight of by the suffering individual ; and it has long been overlooked by those whose business it is to observe what passes, and procure him relief.

What else in fact are those fevers, which for so many centuries have been objects of investigation to the physicians, and the perpetual sources of their hypotheses and controversies, but inflammations misunderstood ? And why has it been so ? Because irritation transmitted to the brain by the part inflamed, and re-transmitted from the brain to

several other tissues, produced stronger sensations than those which are referred to the original center of inflammation. These secondary irritations are what constitute the "sympathies" of the inflammatory state. It will be seen that we do not hesitate to attribute them to the brain ; and our remarks on those inflammations that are not felt, and which do not occasion pain at their place of origin, nor sensation in any other part, justify our opinion.

It has been asked how the nerves can be the agents of sympathy between distant organs supplied with different nerves? It has been forgotten by those who ask this question, that the brain is the center of all the nerves, and that it never receives a stimulation without reflecting it not only to the nerves that transmitted it, but to others.* These reflected stimulations, effect each organ according to the nature of its functions, and often originate in them, irritations more painful than those at the original locality of the inflammation.

This is not only the case in those inflammations which are sufficiently intense to produce fever, but in many others far less violent. Thus it is sometimes with the phlegmasia of the stomach and intestines, which without being themselves the seat of much pain, occasion distressing head aches, pains in the back and loins, in the sides of the chest, in the shoulders, weariness in the limbs, or determinations to delirium, whose cause is mistakenly referred to the head. It is in consequence of these sympathetic transmissions, by means of the brain, that deep seated inflammations in the bronchiæ, irritate the larynx and produce cough ; that inflammations in the parenchyma of the lungs, occasion pains in the back or at the middle of the sternum ; when they occur in the large intestines, they constitute dysentery, affect the loins and the thighs, and produce there more pain than at the inflamed locality ; in like manner, inflammations of the uterus, occasion with many women durable pains in the loins and the groin ; in certain inflammations of the brain, the uneasiness shews itself principally in the stomach and digestive organs, or else in certain muscles which become convulsed and paralytic ; many inflammations of the urinary passages, are painful only at the extremity of the urethra ; those of the

* This fact has been demonstrated in the treatise, On physiology applied to pathology ; and before, in treating of the intellectual and instinctive excitation.

kidneys announce themselves immediately in many cases by vomitings, and the disengagement of much gas in the stomach. This confusion does not take place in external phlegmasia; the form, characters, swelling, pain, heat, redness, are all manifest; the diagnosis of external inflammations has always been more easy than those that take place in organs hidden among the visceral cavities; but for want of a just notion of these sympathies, physicians and surgeons have often mistaken the influence of external inflammations on these organs.

If all internal inflammations shewed themselves by errors of perception always the same, their diagnosis would not present any great difficulty; but the same phlegmasia may present very different sympathies, while in some cases the original and local phenomenon, is far more violent than the secondary results. Hence no doubt the slow march of the science of medicine: these last mentioned inflammations, and those of the surface have been assumed as prototypes, and the others have been misunderstood. Physiological medicine alone, which brings us acquainted with the various functions of the same organ, and teaches us to appreciate the relations that they bear to all the others, can explain the causes and the reasons of this apparent confusion. We cannot enter into the details here.

Among the phenomena which refer themselves to the transmission of irritation, we must note the alterations that take place in the colour, and in the secretions of organs more or less distant from the seat of disease. The most marked examples of this kind attend inflammatory irritation; it is thus that the redness of the tongue, of the palate, and the conjunctiva, corresponds to inflammation of the stomach; that the saliva and mucus of the mouth, are augmented in gastro-duodenal irritation. Similar changes are brought on by inflammation in the pancreatic juice and in the bile. It is always a sympathetic irritation transmitted to the secretory organs, which in lieu of their usual restrained action, all on a sudden excites in them an augmented action, which often passes into a morbid state.

All these sympathies, which we shall denominate organic, cannot take place but through the intervention of the nerves; but there are two orders of nerves; and those which play the principal part in these affections of relation, are the visceral nerves dependent on the great sympathetic,

because they preside over the action of the vascular system. No doubt the cerebral nerves have their part also to perform, for they are connected with the first mentioned order throughout all the viscera; but it is solely as proceeding from the nervous system in general, and keeping up an excitation in that system that the cerebral nerves act; for the intermedium of cerebral perception which belongs exclusively to the cerebral nerves, is by no means necessary to organic symptoms. Still it is a fact that the brain can influence the secretions; thus the idea of meat produces saliva; the idea of the infant, whom she suckles can occasion a flow of milk in a nurse's breast; anger acts upon the liver; and the idea of the act of generation on the testicles. But it is not probable that the intervention of the encephalon, should be necessary to organic sympathies, otherwise than as a cause of general excitement: for irritation pervades the nerves in all directions, and does not need the aid of the brain to pass and be propagated through nervous matter.

This has been already clearly shewn in the first section, of Chap. IV. and we may dispense with the proofs here.

In some cases normal excitement transformed by excess into irritation, throws out the blood which it attracts to the part, and produces hemorrhage. The evacuation of the blood, which forms a conjection, depends on the organic disposition of the part, and on this also, that the exterior pores are less irritated, or less strong and tenacious, than the internal capillaries that act upon them. The analogy which approaches hemorrhage to inflammation, results from identity of cause, similitude of local phenomena, until the moment when the blood is expelled, and the facility with which hemorrhage and inflammation succeed or replace each other, either in the same or in different tissues. Nevertheless, it is not every tissue that is susceptible of spontaneous hemorrhage, while there is no tissue which may not be the seat of that kind of irritation which constitutes phlegmasia.

Irritation developed in the living tissue, does not always alter it so as to produce inflammation. There are cases wherein the principal effect of irritation is to accumulate at the place, the lymphatic part of our humors, and to change the nutrition of the part, in a manner different from the disorganizations that inflammation brings on, and which we have noted already.

This difference arises from the primitive and original dif-

ference of the tissues of which our organs are composed, and on the mode of action and the shade of irritability which presides over the life of each tissue. The areolar and laminar tissue is present in all our organs, and it shews itself among them in various forms: sometimes as small transparent laminæ, more or less relaxed or tightened, and serving as a means of union between the organs, and between the different parts of the same organs; sometimes as fatty tissue, when it fills large spaces between the organs and the apparatus; in other cases, condensed and flattened as membranes, which have always a cellular aspect, corresponding to the rest of the tissue of the same kind, and a surface free and slippery, which corresponds to itself by means of duplicatures and foldings, and which is smooth and slippery by means of the lymphatic vapours by which it is continually moistened: its use is to facilitate considerable removals, and diminish the friction that would otherwise be the consequence.

Such are the tissues of different aspects, but which may be regarded as modifications of one only; and which are the usual seat of the most intense inflammations; a proposition which has been developed in our *History of Chronic Phlegmasiæ*. When irritation has displayed itself there with energy, it attracts much blood to the parts, it swells them out, expands them where they are not too much condensed, and produces the phlegmon of which we have already spoken, and which has long been regarded as the type of all inflammations. But below this first degree of vascular irritation, a crowd of others group themselves, which are not less worthy of attention. Let us try in few words to give a clear idea of them.

The first fact that strikes us is, that these same tissues are susceptible of another degree of irritation, which may itself be divided into several secondary degrees. Indeed, when irritation has not conducted these tissues through inflammation, to suppuration or gangrene; when it has not terminated by a gradual loss of its activity, and by organizing the lymph at the surface of inflamed parts, it engorges them with the same fluids for which, in their normal state, they served as a depot, and alters the nature of their nutrition in ways more or less extraordinary: hence, the degenerations that put on the character of lard, or fat, the fibrous, schirrous, encephaloid, &c. These degenerations were formerly ascribed to some virus, or specific depravations of the humors;

but observations made on their causes, on their progress, on their relation to other affections, and on their methods of cure, have demonstrated that they are nothing else but products of irritation.—See the “*History of Phlegmasia*,” article *Peritonitis*. Such is the first variety of sub-inflammations, that are seated in the same tissues, wherein inflammation is apt to develope itself with the greatest degree of intensity.

The second variety of sub-inflammations, is manifested in lymphatic ganglions, which are found every where in the course of the absorbent vessels of a certain size. These little bodies are composed of blood vessels, nerves, and lymphatics, united by the areolar tissue; but it is not well known, in what manner the different tissues that compose them are disposed. In all cases, we may observe that irritation takes place in them under the influence of certain exciting causes, and that it may be augmented into inflammation, which however is not common; but the ganglions are often irritated in a manner that makes them swell, and hardens them with a remarkable augmentation of temperature, and reduces them at length to a white substance, somewhat like old cheese: this is the second variety of sub-inflammation.

The areolar tissue, and the ganglionic lymphatic, constitute a part of all our organic apparatus. It is not surprising, therefore, to find them affected and degenerated in all long continued irritations of that apparatus. These two first elements being well understood, let us proceed to such appearances as belong particularly to these irritations.

And first of all, let us fix our attention on those secretory organs, whose business it is to elaborate the humours destined to the performance of several functions. Such are the salivary glands, the liver, the pancreas, the kidneys, the testicules, the mammary glands, the follicles spread over all the surfaces of relation, as well external as internal, and certain glands of a similar nature, such as the amygdoloid, the prostrate, the lacrymal glands. All these are composed of a proper secreting tissue, which varies in a small degree, but which is always reducible, to blood vessels; to the vessels which eliminate the secreted humor; to lymphatic ganglions in the larger ones; and absorbent vessels in all of them, to nerves more or fewer; and a cellular tissue, more or less abundant, more or less relaxed or stretched, and which serves as a means of union to these various tissues.

These organs, moreover, offer to our remark the first mode of organic irritation, inflammation ; which, in its highest degree, confuses all these tissues by expanding excessively the cellular tissue, and filling it with blood, accompanied by heat, pain, and imminent danger of suppuration or gangrene. But, if we examine all these secreting organs, when they are not tormented by this rapid action, we shall find nothing but irritation excited by the same causes that produce phlegmon, or by the action of several other excitants, and confined in its influence to some of their tissues in particular. Thus, when a gland slightly hot and swelled, ceases on a sudden to secrete, or furnishes its fluid in greater quantity than usual, or presents it more or less altered, diffuent, concrete, odorant, irritant as to the neighboring parts ; when this fluid, badly elaborated, becomes decomposed, forming concretions more or less solid, with a feeling of smarting, weight, lancinating pains, &c. can we avoid concluding that irritation has taken up its abode in that portion of the glandular apparatus, which is destined to form saliva in the salivary glands, bile in the liver, urine in the kidneys, seed in the testicules, fat or transpirable matter in the skin, mucosity in the internal membranes of the lungs, the gastric passages, the bladder, &c. ? At length, after these organs having, for a long time secreted improperly, begin to swell, to harden, to become painful, to put on a schirrous appearance, or pass into a cancerous state—instructed by what passes daily under our eyes, in tissues purely cellular, or ganglionic, when feebly irritated, we shall at length begin to think that the tissues which constitute part of our secretory glands have, in like manner, been affected by irritation.

Thus it has been, that the supposed humoral diseases formerly attributed to ferments, to acridities, to virus, such as salivations, bilious affections, obstructions of the liver connected with chronic gastro-enteritis, obstinate pulmonic catarrhs, obstructions of the bladder or the rectum, tetters, involuntary emissions, fluor albus, diabetes, gouty affections, &c. rank among irritations, or sub-inflammations of the secretory organs, and finally belong to sub-inflammations, either mixed, lymphatic, cancerous, or tubercular ; when the chronic irritation has continued in the secretory organs, sufficiently long to induce a complete degeneration.

We now begin to study vascular irritation in the more complicated tissues ; and hereafter, in examining irritation

in those tissues of which we have not yet spoken, we shall be able to find nothing contrary to our preceding remarks, since the areolar tissue and the membranes formed of it, constitute the basis of the others. Every where, in fact, in the organs which remain to be examined, we ought to meet, 1st, in the highest degree, phlegmon, if the areolar tissue, where the capillary arteries terminate, is free to expand itself. 2dly, in the lower degrees, and where the areolar tissue is condensed, compressed, we meet either sub-inflammations the effect of inflammation that has been abortive, or sub-inflammations primitively and originally such. These sub-inflammations, whether primitive or secondary, if of long duration, always produce tumours, lardaceous, encephaloid, schirrous, tubercular, vegetations, collections of lymph, or concretions ; in short, when the inflammation which reigns in these altered tissues, is strongly exasperated, either by the influence of its own progress, or by causes of great activity, cancer becomes the last and deadly consequence.

What we have thus summarily and briefly stated, embraces all the inflammations of the locomotive apparatus, known under the name of rheumatism and gout, when they are caused by cold, or succeed to visceral irritations. These are very common diseases, which may be seated either, 1st, in the muscles, where the phlegmonous type may take place, from the quantity of free cellular tissue, that separates the fasciculi of muscle. 2dly, In the aponeuroses and the tendons, where inflammation so often becomes abortive, and assumes the character of sub-inflammation. 3dly, In the articulations, where irritation behaves at first differently, according to the constitution of the subjects, and according as it makes its appearance at the interior of the capsules, or in the ligaments to which the bones are connected, but where it always ends by losing itself in various stages of sub-inflammation. 4thly, In the cartilages and bones, which admit the irritation of soft parts, and which, in their turn, are altered by becoming soft, by caries, or by necrosis.

The irritations of the same tissues determined by violent causes, are subject to the same laws. In fact, phlegmons either acute or chronic, caries, white swelling of the articulations, the consequence of wounds or contusions, only re-produce in the locomotive apparatus the various phenomena of which gout and rheumatism are specimens. The

phenomena of transmission remain; and experience shows us that the irritation of the locomotive apparatus may be transferred to the viscera, and affects them according to their respective modes of organization.* Finally, we have to speak of the irritations that are seated in the nervous apparatus or system. We shall divide this apparatus into three sections: 1st. The first, will comprehend the nervous extremities that are lost in the tissues, where they become confounded with the sanguinary capillaries, and constitute a part of the organ itself. This portion of the nervous system is least understood as to its intimate structure. This it is which receives the stimulations, and transmits them to the second portions or the nervous cords. The irritations to which it submits, are divided with the organs of which it forms a part; but it may be more or less affected by them. 2dly, The second section, or the nervous cords, are of two kinds, viz. the *cerebral* nerves, which consist, as is said, of nerves of feeling, and nerves† of motion; and the *splanchnic* nerves. The nervous cords are sprinkled here and there at intervals, with swellings or protuberances gelatinofibrinous, called ganglions. 3dly, The third section, comprehends the cerebral nerves, properly so called, those of the cerebellum and medulla oblongata, and those of the spinal marrow, (rachidian) which forms what is called the cerebro-rachidian apparatus, or internal sensitive nerve. We are now about to take up the irritations of these three sections of the nervous system.

The first fact which strikes us, is one that we have already spoken of several times, to wit, that all the irritations of a certain intensity, which the first division necessarily partakes of, are transported by the nerves of the second section to the internal sensitive, which constitutes the third; and are reflected by the third, back again into the second, and thence anew to the first. Thus it is, that there are no lively sensations, no considerable muscular movements, which do not attest this circle of excitement. So long as these excitations are proportioned to those of the organs which admit them, they constitute no malady; but when they go beyond this, a nervous affection takes place, a *neurosis*.

* *Quicquid recipitur, recipitur ad modum recipientis*; is the old school maxim, of most useful application in a thousand instances.—*Transl.*

† There seems at present little doubt of this, since the experiments of Mr. Bell, Mr. Broughton, Magendie, &c.—*Transl.*

The first division of neuroses consists of painful sensations and convulsive motions, which are excited by some one of those vascular irritations of which we have spoken, and which become so predominant, that the patient complains greatly, and seeks eagerly to be delivered from them. The cases are, 1st, those of persons who by reason of some wound or lesion not immediately injuring a nervous cord, experience great pain, convulsion or tetanus. 2dly, those who being attacked at first by acute phlegmonous inflammation in the digestive organs (the continued or essential fevers so called) soon become affected with delirium or convulsions: or who being worried by chronic inflammation, either of the digestive canal, or some other of the viscera, as the uterus, the heart, the bronchiæ, refer it to a crowd of painful sensations, and become affected with irregular motions of the visceral, the respiratory, and locomotive muscles; this class comprises hypochondriacs and hysterical patients. The number is very great; for in the modern state of civilization, few persons arrive at middle age without having contracted a morbid excess of sensibility in some part of the body. Man is greedy of sensations; he obtains them only by excitation, and every organ requires this; he excites his stomach more, and more frequently than he ought, especially by savory food and fermented liquors; he compels his heart to beat with unreasonable rapidity, either by the passions to which he gives himself up, or by painful and irritating exercise to which he submits; he worries his sexual organs to excite in them pleasurable sensations, and seldom arrives at a due estimate of his powers in this respect, till he has abused them to the injury of his health. Moreover, as man, he is exposed to a multitude of causes which tend to disturb the balance of his excitability. Sometimes cold freezes his senses, and paralyses his limbs, which re-assume their motions only to expose him to violent pain; to fits of the rheumatism or the gout, whose intensity increases as he has voluntarily contributed to the irritations of his stomach: sometimes he is overwhelmed with the weight of painful affections; and his sufferings are increased by his own self reproaches; or death sometimes snatches from him, the being that attached him to life. If the reader has not lost sight of the developements heretofore made on the functions of the nervous system, he may easily comprehend, that a man cannot live long in the midst of these terrible attacks,

without irritation taking up its permanent abode in one or more of the organs. At first, it is the nervous matter of the organ which is over excited; to this succeeds sub-inflammation and inflammation; while these two modes of irritation do not disorganise the diseased tissue, the nervous phenomena, that is, the sensations more or less painful, more or less extraordinary, as well as the contractions and convulsive tortures of the nervous fibres, are all moveable and curable; but when an irregular abnormal nutrition produces different modes of vascular irritation, and have altered the nature of the irritated tissues, there is no resource in medicine. The organs and apparatus of which these tissues form a part, can no longer live but in an unnatural and vitiated manner. The nervous matter which forms a part of them, is no longer in unison with the other regions of the body; it transmits to the encephalic centre an excess of excitement, and compels it in consequence to act too strongly upon other nerves; so that harmony and regularity can no longer reign over the living economy. The remainder of life is passed in perpetual pain, and in pain strongly diversified as to its type: for the patient does not only suffer in the diseased organs; he refers his uneasy sensations successively to every department of sensibility. He connects his painful and unusual emotions, with all the ideas he has received since he began to know himself. He wanders, he suffers, and he causes every body else to suffer who approach him. Such is the neuropathic.

All these morbid states bear witness, that in perceiving an irritation, and in determining the voluntary or involuntary motions which are the results of this perception, the internal apparatus of sensibility is itself excited to the degree that constitutes irritation. Once brought to this abnormal diapason, the system may undergo all the consequences of it: that is to say, its irritation may become phlegmasia, hemorrhage, or sub-inflammation. It is thus that encephalitis, arachnoiditis, become complicated into what was formerly termed essential fever; and that melancholy, hypochondriac, and hysteric patients, become lunatic, epileptic, or struck with apoplexy. Such is the secondary irritation of the nervous system. At first it is neurosis: it then becomes transformed into something more humoural, viz. vascular irritation.*

* There is much vague notion and uncertainty among physicians of the present day, on inflammations of the serous envelope of the brain, called

The second fact on which we ought to bestow our attention is, that the nerves (the nervous cords) being in part formed of the same laminar tissue which we have shown to be most liable to contract inflammation, the nerves are exposed to the same mode of irritation, which ought to affect them more or less according as the same tissue which forms their neurilema, is more or less abundant, more compressed and condensed. In fact, without speaking of affections that arise from wounds which may attack the nerves as well as any other organ, there are other causes which direct and fix irritation in the nervous branches, and carry them on to the degree of phlegmasia. The inflammation of the large

the *tunica arachnoides*. Many observers attribute madness exclusively to the phlegmasia of that part, as if the substance of the brain could possibly be a stranger to it. Others think that the pia mater may become inflamed. Others maintain that madness depends exclusively on the inflammation of the grey portion of the medullary substance, which occupies the convex portion of the cerebral hemispheres. It is our opinion, that irritation in the encephalon cannot increase into inflammation, unless the blood vessels are also actively influenced. On the other hand, we cannot conceive that delirium can take place without an excitation of the white fibres of the encephalon, which evidently constitute its particular nervous system. From these data, it seems to us that we may assume it as certain, that inflammation first appears in the pia mater, from whence it may propagate itself convergingly into the grey and into the white substance; and divergingly into the arachnoid membrane, even to the dura mater and the bone, as is shewn in the ivory skulls of lunatics. It is easy to conceive that a centre of inflammation, occupying a space more or less considerable in the vascular sanguineous cap which envelopes the brain, may propagate itself to the grey substance, and throw into the white medullary substance irritation enough to occasion lunacy. Many things may be said as to the slight shades of irritation in these same tissues, in the case where it acts upon the blood vessels in a degree below suppuratory inflammation—in cases where it resides more especially in the white portion of the brain and its nervous matter—or in this or that region of this substance; that is to say, in this or that section of the intercranial nervous apparatus—but of all this we must say nothing but what rests on the basis of facts. We shall speak of this again. But we may observe in addition here, in relation to the inflammations of the *tunica arachnoides*, that inflammation not proceeding from wounds or violent lesions (*non traumaticques*) establishes itself in the encephalon in two ways, 1st, Sometimes by means of some moral cause, when the irritation takes place in the white medullary fibre, and agitates first the inter-cranial nerves under the types of delirium and convulsions; and ends by acting on the sanguineous capillaries, in which it produces inflammation; 2dly, Irritation sometimes seated in some other vascular sanguineous tissue, becomes propagated by organic sympathies in the pia mater and the arachnoid coat. Do not lunacies and arachnitis proceeding from moral causes, belong to the first section? Do not lunacies proceeding from gastro-enteritis belong the second?

nervous cords of the loins, the thighs, the arms, is by no means uncommon as a consequence of cold, or the suppression of hemorrhages, or cutaneous or articular inflammations; local pains and convulsions (neuralgies) arise from the same cause. These affections may be determined to any branches of nerves on the exterior of the body, by the irritation of any nervous cord belonging to them, which may find itself enveloped by inflamed parts. The inflammation of the roots of the teeth, by attacking the nerve inserted, is sufficient to produce neuralgia in different branches of the fifth pair, and in the facial nerve. Here then is a second kind of neurosis belonging exclusively to the second section of the nervous apparatus, and referring itself to inflammatory irritation. We see clearly too, that while it depends in part on the vascular inflammation of the organs, it is connected also with the internal sensitive or encephalic apparatus; seeing that the perception of pain always implies an excitation of the encephalic tissue, and that all excitation may increase into irritation.

This last reflection calls us to the consideration of the great fact, on which depend neuroses of the third division. This manifestly relates to the cases where the substance of the cerebro-rachidian apparatus is excited to the degree of irritation. This may happen, at first, as a consequence of the two primary divisions of the nervous state. For delirium, convulsions, lunacy, which depend on the irritation more or less intense of the brain and its membranes, may be provoked by picking, tearing, or pinching a nervous cord, far removed from the head, as well as by acute or chronic inflammation of the viscera. Let the primitive irritations of the encephalon then take place, and this section will comprise all the affections we have recounted, such as delirium, transitory or permanent, intermittent or continued; and convulsion; in so far as these maladies are dependent on local causes extra cerebral, and brought on by excitations directly applied to the encephalon, as by external violence; or in so far also as they are excited in that apparatus by intellectual labor, by moral causes, by sanguineous plethora, &c. In short, whatever may be the cause that has produced irritation in the brain, it may produce also, delirium, coma, epilepsies, apoplexies, palsies; all of them signs, indicating that encephalic inflammation has become vascular, and that it partakes of the inflammatory state; the results

are, sanguineous engorgement, suppuration, indurations, extravasations of blood and lymph, ulcerations, and other degenerations, more or less considerable, such as, schirrous, cartilaginous, osseous, &c. depending on some fault of nutrition; always analogous to what we observe in other tissues, wherein we have studied the important phenomena of vascular irritation.

Such is the brief picture of the second class of maladies, and of those that depend on irritation, whether secondary or primary. To these, we must add the affections, which are the consequences of these two classes: although not primitive, they often present indications which merit a particular examination.

The *first general* fact at which we ought to stop awhile, is the obstacle to the course of the blood, either partial or general. The consequence always is, either a debility which directs the fluids to one point, or an irritation which excites them to flow thither: such are aneurisms of the heart and arteries, inflammations of the arteries, phlebitis, varices and tumors, from whatever cause they may proceed, and which take place on the course of the principal vessels. This form of disease cannot be well distinguished, until the affections of our organs are referred to their true causes; hence the old physicians had but a very imperfect comprehension of them.

The obstacles to the course of the blood, which are of the most interest, are those that form in the centre of circulation. Let the obstacle depend on the depression of the heart, caused by an effusion within the pericardium, or even pleuritic; or let it proceed from a distension of the sides of the heart, with the softening of the parietes; or let it be owing to induration, with diminution of volume, without inflammation of the pericardium; let the cause of the obstacle be in the one auricle or the other; let it arise from a dilation at the crossing of the aorta and vena cava, or from an inflammatory exudation which has contracted the caliber of the principle vessels in the vicinity of the heart, by its concretion; let it result from the obliteration of the orifices of the aorta by some fungosity, or some vegetation on the muscular sides while they preserve their vigor; or from some irregular dilatation of the same orifices with a softening of the fleshy substance of the organ; let there be a hernia of the ventricles, or a laceration of the columns:

still the fundamental symptoms will always be the same. Many accessory symptoms may arise belonging to the specific character of the lesion, but they will be variable as the irritability is, which ought to be the interpreter of all vital lesions ; but the three following are never wanting : 1st, difficulty of respiration. 2dly, of locomotion or even impossibility sometimes of moving. 3dly, difficulty or impossibility of sleeping.

The coincidence of these three orders of symptoms constitute the pathognomonic sign of the central obstacle to the course of the blood ; and of course indicate a forced stagnation of this fluid in the vessels of the larger viscera, and particularly in the parenchyma of the lungs. These are also the symptoms which furnish the fundamental indications, by throwing light on the probable consequences of the malady, and which suggest to the physician the necessity of a very minute investigation to ascertain the specific and peculiar cause of the obstacle. Moreover, it may be possible that this cause is but momentaneous, as a spasm of the heart, such as we see in some fits of convulsive asthma ; for it is the perseverance only of the sympathies that furnishes proof of some permanent obstacle to the course of the blood. (See *Commentaries on Pathology*.) In short, in all desperate cases, it is the same group of symptoms which furnish the only indications which remain to be attended to, when we desire to alleviate the sufferings of the patient, and put off as long as possible the last hour. How many reasons are here for disinterring from the chaos of antiquity the pathology of those lesions which belonging to the obstructed passage of the blood through the double straits of the thoracic centre, so as to establish the real characters of a peculiar class of maladies ! a number of symptoms group themselves around those lesions ; the union of these symptoms constitute the character of the disorders in question ; but this is not exactly the time to enter into details.

The second general effect we inquire about, is the extravasation of the serous fluids, or dropsies. Sometimes they are occasioned by direct debility owing to exhausted excitability, as at the close of great loss of blood, want of food, watery regimen, humid atmosphere, &c. Sometimes they are produced by irritation occasioning an interior exhalation viciously substituted to the purifying serous excretions. Sometimes these dropsies are indirectly provoked by these

vicious exhalations in consequence of the acute inflammation which they give rise to. Dropsies then are sometimes primitive, sometimes and more frequently consecutive; but in this latter case they always become for the living subject a cause of secondary irritation and of suffering; and constantly present, besides the indications of the disease itself, the indication also of provoking the evacuation of the serous fluid extravacated. Hence we are obliged to make of these maladies a particular class; but we have not at present leisure to enter into the details respecting them.

The third and constant effect of diseases of every kind, is to produce an attack upon the assimilating power of the system, and to prevent the perfect elaboration of the humors. Hence arise a number of symptoms, which refer to cacochymy and scurvy of medical writers. These maladies are also characterized by the indication of a certain kind of alimentation; and for this double reason they deserve to be treated separately.

Scurvy may be primitive, dependant on food of bad quality, on an atmosphere cold, wet, dull, unwholesome. One of its characteristic symptoms; is defect of contractility of muscular fibrine, the common source of the languor felt by the patient, and the feebleness of his locomotion; another symptom is extravasation of blood in the skin and sub-cutaneous tissue. But it is important here to remark, 1st, that the internal membrane of the digestive canal, always receives the first attack, being peculiarly the organ of assimilation. Hence the patient is exposed to chronic phlegmasia or to hemorrhage of that canal, including the gums: 2dly, that scorbutic persons are far from being exempt from phlegmasiæ in the other organs, but they incur them with greater certainty in proportion as they are exposed to one of the most frequent causes of scurvy, cold combined with humidity; 3dly that inflammation shews itself in scurvy under two varieties, chronic apyrexia, as in the gums, and the mucous membrane of the digestive organs, which is no obstacle to the attack of *cold*; and the acute and feverish scurvy, which may shew itself in all the organs: constituting the *hot scurvy* of authors; wherein the patient is equally susceptible of intermitting irritations: 4thly that the tissues of the scorbutic patient, having a less force of cohesion, and less force of organic affinity than healthy persons, are also more exposed to disorganizations. Hence

the aneurisms of the heart, and the laceration of the muscles even by moderate exertions, in scorbutic patients: hence the large ecchymoses from slight contusions, and the astonishing rapidity with which inflammation in scorbutics produces disorganization: 5thly, as there are always two sets of indications in scurvy, (*a*) that owing to vicious assimilation, which demands fresh food particularly vegetable, a dry atmosphere frequently renewed, and light: (*b*) the indication furnished by the complicated states of inflammation; which are treated as in other subjects, but with more caution as to the loss of blood. For all these reasons, scurvy ought to hold a separate place in works of pathology.

The fourth general effect which we have to consider, is the debility consequent on the irritations which we have thus briefly noted. Weakness is indeed the common result of all our maladies; and the indication of restoring strength, follows always on the process of diminishing it. Every tissue whose vascular system has been engorged by irritation, becomes weakened and relaxed after a certain time, and in proportion as the sum of the general forces has been more or less diminished. Every nerve whose action has been exaggerated, loses more or less of its excitability, and sometimes becomes paralytic. The cerebral nerves in particular are always palsied, when irritation has disorganized their point of insertion, whether in the brain or spinal marrow. In all these cases the general sum of bodily strength is always more or less diminished; and the indication of stimulating, must always be tempered by that of managing the excitability of the organs. This is enough to constitute a particular class of diseases.

Such is the general history of irritation, and a foreshortened painting of the physiological doctrine. No vital phenomenon, normal or abnormal, can be taken from its domain: physicians must chuse between two methods of philosophizing: they must be physiologists and adopt irritability as their guide; or they must be empyrics, exposed to a thousand contradictions of theory and practice; and then they can draw but few useful conclusions from the observations they have made. We have frequently treated this question in the discourses pronounced at the opening of our private and public courses, and in our *Examination of medical doctrines*: but to render the great importance of this remark more evident, we shall proceed to consider INSANITY (*la*

Folie) one of the maladies which have been treated empirically by the old physicians, but which requires more particularly to be exposed to the lights of rational theory. In choosing lunacy (insanity) for the application of the physiological principles herein laid down, in preference to any particular malady, we have a double object; viz, to contribute as far as possible to the perfection of the therapeutics of this deplorable disease, which has not yet been fully brought to the test of our principles *professedly*; and also to contribute to the improvement of real knowledge, by the overthrow of what is called *ontology*.

ON IRRITATION AND INSANITY.

PART THE SECOND.—*On Insanity considered in reference to the principles of Physiological medicine, and the Phenomena of Irritation.*

CHAPTER I.—ON THE CAUSES OF INSANITY.

Medically speaking, Insanity is the prolonged cessation of the action of the brain, which in its normal state, is the regulator of human conduct, and that on which depends what we call *Reason*. But before insanity can be imputed, the patients must be able to exhibit the due functions of most of the other organs: for we do not consider frenzy, or the situation of many diseased persons attacked with acute inflammation, as insanity, though they may be deprived of reason. When this instrument of intellect (the brain) is depraved, man can no longer resist the blind impulse of instinct, and even instinct is more or less depraved in insanity: hence arises the possibility of all kinds of aberration in the discourse and the actions of persons labouring under mental alienation. The brain or rather the encephalic apparatus, consisting of the brain properly so called, the cerebellum, and medulla oblongata, the common center of the nervous system—the brain I say, is the peculiar organ of instinct and of intellect; and these two faculties (as they are called) alter always with any alteration in the brain. The encephalic

phalic apparatus cannot be reasonably supposed to obey any law different from those which regulate the other organs. Derangements of instinct and of intellect therefore must result from excess or defect of excitation in the encephalon. (See part 1st, Chap. 4th.) An original defect of excitation does not produce a durable depravation of instinct or of intellect; insanity therefore must arise only from super excitation, that is irritation of the encephalon.

The sources of insanity may be classed like those of other diseases: they are reducible to the influence of hygienic causes, and the influence of other diseases on the encephalon.

These causes will allow of the same division as in all other diseases of irritation, that is to say, we may consider them according to the various hygienic influences to which they belong. At the head of these, we place the *perceptions* (*percepta*) as the leading sources of mental maladies, and we shall designate them as *moral causes*. But we meet here with two modes of excitation which are purely physical; passions too violent, which we rank first as most influential: and intellectual labour pushed too far. The passions cause an afflux of blood to the brain, and increase all the phenomena of innervation. Hence result simultaneous excitement of the heart, the lungs, the stomach, the liver, and the genital-urinary organs; the whole locomotive apparatus also participates in this excitement. The passions are either those of pleasurable or of painful feeling. The one and the other, in their simple state, violently agitate the nervous system. But there are moral situations, wherein men experience in succession and with great rapidity, sensations of pleasure and of pain. Such is the unhappy state, when the expectations of ambition, of pride, or of self-love, are frustrated; this is the state brought on by envy, by jealousy, and the alternations of hope and despair; producing the rudest attacks on reason.

Intellectual labour pushed too far may produce a derangement of ideas, first, by the excitation which implies a long continued attention and neglect of sleep; next by the passionate movements which almost always intermingle, such as ambition, jealousy, self-love, exalted or depressed. Sorrow and fear considered as acting each by itself on our organs, have a sedative effect as it should seem; because the pulse is depressed by them, and the locomotive powers are paralysed. The sedative effect is not always complete; there

is always a kind of encephalic excitation which accompanies attention, and we cannot deny that it is one of the most active. This encephalic vital erection, or this constant form of innervation, may present the other forms in a very high degree, of grief, terror and surprise, and occasion sudden death: but when this case does not occur, a re-active innervation takes place, which like the direct excitations of lively passions tends to inflammation.

We never observe insanity from a moral cause manifest itself in a recent subject, without being accompanied at its commencement by that sanguine excitation, of which we shall very soon present a picture.

Children are very seldom susceptible of insanity from moral causes, because their impressions are not so durable as those of adults; but the intensity of impressions may be a substitute for their durability. Moreover there are some children who have a premature developement of the encephalon which renders them susceptible of melancholy that may prove a cause of mental alienation.

We see nothing in the action of other hygienic circumstances, or in other physical causes except the excitation of different organs. We shall place at the head of these, the excitations of the brain itself in reference to the *applicata* and some neighbouring diseases of the encephalon produced by wounds, bruises of the head, concussions, inflammations of the hairy scalp in cases of erisipelas from some internal cause, or erythema from external cause, insolation, inflammation of the parotids, in a word, by all the centers of inflammation in the neighbourhood of this organ of thought, because inflammation may easily be propagated to it.

Next to neighbouring inflammations, we find as most influential those of the stomach, the duodenum, and the liver, which may be produced by several hygienic causes, but which depend for the most part on the *ingesta* and the *pércepta*. In fact a large proportion of men, contract under the influence of food too exciting, of poisons, or over exciting medicaments, chronic gastritis; which after keeping them in a state of hypochondria and nervous affections for several years, often finishes by mental alienation. Others lose their reason from the same causes in less time. If it be extremely short, and that the gastritis is acute, the delirium is not termed insanity; it arranges itself as frenzy, and febrile delirium. But what is remarkable, is, that moral causes, those

which act more immediately on the brain, do not produce insanity till after they have produced and kept up for some time gastric inflammation; as if the encephalon stood in need, in some people, of the reaction of the viscera to produce a high state of cerebral irritation. This is the case of many persons melancholic from nostalgia, from disappointed love, from loss of fortune, from wounded self-love, &c. who do not lose their reason till they have suffered long under gastro-enteritis with symptoms of neuropathy. In fact we need not be surprised at this, because with many persons, moral commotions, though received in the brain, produce at the moment less effect on the organization of that viscus, than on the heart, the lungs, and the stomach. The brain never suffers alone, as we have demonstrated in our physiology. Perhaps we may sometime or other arrive at the proof, at least for the physiologist, that sensation is composed of a circle of excitation pervading the encephalon and all the nervous extremities. But a very arduous duty which is now imposed on us, prevents us from treating this question, which would be perfectly in its place here.

The excitations of the other viscera, the heart, the lungs, the larger intestines, the spleen, the kidneys, the bladder, whatever may be the hygienic causes to which we may attribute their origin, do not disturb the *reason*; except under acute inflammation of great intensity: and in this case the delirium produced is not *insanity*.

We shall not say as much of the over excitation of the sexual organs, to which the *percepta* the *ingesta*, and even the *applicata* contribute, as well as other causes. The generative viscera, more rich in the nerves of relation than the organs before mentioned, and not less provided than they are with branches from the great sympathetic, partake equally with the stomach (which also abounds in the same kinds of nerves) the power of exciting vividly the encephalon. Add to this privilege, that also of affecting sympathetically the stomach and all the epigastric nerves with this over excitement, and you will easily perceive how hysterical women, and those afflicted with nymphomania are liable to become insane. This influence is far less among men.

In every case irritation acts first sympathetically on the brain; and this last more slowly becomes affected idiosyncratically, without abandoning the organ originally attacked.

The last order of physical causes is composed of misplaced irritation. The irritation of other parts ceasing, the brain becomes affected. It is not usual for the viscera to furnish the point of departure for these kinds of metastases: we see them frequently act on the encephalon; but usually this happens without their ceasing to be irritated themselves, as we have before remarked; they only seem to be less irritated as the brain becomes more so; but this organ always sends back to them sufficient of excitation to prevent their becoming completely cured even if they were disposed so to be. The external organs, particularly the skin, the mouths of the mucous membranes, and the articulations, are the chief parts that irritation quits to attack the viscera; and if the brain be somewhat pre-disposed, it is always severely affected. Remember, also, that it is almost always in connection with the stomach and the heart that importance is given to these metastases. Here we may rank all those insanities that arise from the sudden disappearance of tetters, erisipelas, hemorrhages, natural or artificial, old ulcerations, crusty exsudations, sweats, partial, fetid, thick, unusual; disappearances that connect themselves with *excreta* of the Hygienists, with the retrocession of gout, rheumatism, &c.

The insanity so often supervenient upon child-birth, does not arise from one organ only; every organ is in a state of unusual excitement at that remarkable epocha. All are in danger of congestion; and if the necessary evacuations are interrupted, a slight cause may produce a determination to the brain, as well as to any other of the visceral apparatus; and this determining cause is often a moral one.

As these causes do not always and necessarily produce insanity, we are compelled to admit a pre-disposition in the individuals to whom it happens. This pre-disposition can only depend on excessive irritability of the encephalon, or on its vitious developement. In fact, when the encephalon is too irritable, it retains for too long a time the stimulations it has received, and passes into a state of permanent irritation. When its irritability is imperfectly developed, or too feeble, it cannot resist the violent impulse of the passions, or the excessive vital erections which accompany great efforts of attention and memory. When this irritability is too strongly developed, the brain supplies a prodigious facility which renders intellectual labor very agreeable. In the second mode of organization, the over excitement proceeds from

weakness of intellect ; in the third, it proceeds from vigor of intellect, by the abuse we commit of an enjoyment which has become a want of the first necessity. It is thus, that a weak stomach is excited by a moderate dose of wine, and a strong stomach by a four-fold dose ; to which we expose ourselves more carelessly, in proportion, as we have suffered less from former excesses. The middle course is the least subject to great derangements. *In medio tutissimus ibis.*

CHAPTER II.—ON THE INCUBATION OF INSANITY : * TWO FORMS ARE HERETO BE NOTED.

When the encephalon has been over-excited somewhat permanently, by the passions, and the efforts of attention and memory, insanity is imminent. It is so, also, when the encephalon is continually stimulated by irradiations which take their departure from the stomach, over-irritated in both sexes ; and when the genital organs are in a state of acute sub-inflammation in the female ; because *this state is always accompanied by a general irritation of the nervous apparatus, which renders all the sensations too vivid.* Hence proceed two modes of incubation and explosion of insanity—the one cerebral—the other not cerebral ; and the one and the other may be either acute or chronic.

Cerebral incubation of the acute form—the effect of active causes in a young and irritable subject, is nothing else than an irritation of the brain, indicated by the heat of the head, redness of the face and eyes, cephalalgies, vertigoes, and confusion of ideas. This state may also be the consequence of acute cerebral inflammation from whatever cause. The patients feel themselves compelled to contemplate certain visionary images which beset them : these images combine together in a manner unusual and monstrous : it is in vain that reason revolts at them : they press upon the attention of the sick person, and he feels that they are upon the point of becoming realities, and depriving him of what is left of his reason. He experiences, as a secondary symptom, troubles in his digestive organs, great thirst, and either a disinclination for food, or an excess of appetite, bitterness in the mouth, heat in the epigastrium, pulsations, palpitations, and a sense of stricture about the heart, a stoppage of the breath, shudderings, startings, want of sleep, indefinable agitations, sadness or irascibility, rage, sudden impulses to do some

* That is, circumstances that precede and aid its developement.—*Trans.*

wrong act produced by an instinct depraved by irritation ; impulses which he resists at first, and to which he does not yield till he has lost his reason.

Chronic cerebral incubation, differs from the former only in a less degree of intensity. It is often the result of moral causes that have not acted forcibly, or else it depends on a less degree of vigor, of irritability, and of energy of the sanguinary system. It frequently lasts several months, and even years. It is more frequently remarked among persons of a singular and original character, prone to false judgments, who love privacy and concealment, and have never felt the want of the effusions and confidences of friendship ; and have always been suspected of some kind of insanity, though that word has never been applied to them in its full meaning. In general, heads like these, that are not in unison with the common run of mankind, are continually at work as the common expression is : that is to say, are vividly excited by causes that produce but little effect on others, and are in a constant state of irritation, that leads them insensibly on to insanity. Acute and chronic cerebral incubation, may be equally the result of somewhat too little, or somewhat too great a developement of the brain, and the facility or the difficulty attending intellectual operations. A thousand circumstances may introduce varieties in the degree of intensity of the causes which solicit the over action of the brain.

In this last incubation, the breaking out of insanity is repressed frequently by reason, which resists it much longer than in the preceding. Frequently, also, insanity is present long before it is distinctly perceived ; for usually the name of insanity is given to an increase of irritation determined by some accidental cause which only substitutes an acute or sub-acute type, to the chronic, habitual state.

Cerebral incubation, may also be a consequence of cerebral irritation, which manifests itself in a form different from insanity. Long continued megrims, repeated attacks of plethora, apoplectic congestions, incomplete palsies, habitual catalepsies, extasies, epilepsies, constitute so many predisposing and determining causes to insanity. This may break out sometimes under an acute, sometimes under a chronic form, according to the strength of the subject ; sometimes it may appear as dementia, a still more unhappy condition, of which we shall speak by-and-by.

Non-cerebral incubation is usually gastric. It relates to

persons who are commonly called hypochondriacs, and sometimes melancholics. To the chronic gastritis which torments them, may be joined some one of the hereafter mentioned cerebral pre-dispositions; and then there exists a double irritation which tends to weaken the reason. The irritation is triple, if the genital organs are simultaneously affected, as we may observe among certain hysteric and nymphomaniac females.

The signs of gastritis here, are such as we see them in their unconnected state. Acute sense of feeling, or pains perceived at the epigastrium, or at the bottom of one or both, the hypochondria, flatulence, alimentary or musty eructations, slow digestion, constipation, irregular diarrhœas, red tongue, and other symptoms of gastro-enteritis; to which must be added a crowd of sensations, more or less insupportable, in the head, in the organs of motion, and even inside the body. All these evils worry the spirits of the patient, dispose him to sadness, to solitude, to continual reflections on the state of his health, to want of sleep, to the perusal of books on medicine, to enquiries after secrets and quacks: the diseased persons persuade themselves that they are afflicted with all the maladies which they hear spoken of, a croud of imaginary diseases lay siege to them, and they are subject, from time to time, to hallucinations. Although awake, and in open day, they think they hear voices that call them, or that they feel some person lay hold of them, and pull them by the hair, &c. Their dreams are frightful, and when wide awake, they think they hear and see the objects that occupied them while asleep.

Hysterical women are at first troubled with a sensation of heat and acridity in the sexual organs—often, with fluor-albus; their menstrual discharges are irregular; the neck of the womb is hot; and if the uterus be lifted up by the finger, the sense of stifling and globus hystericus is produced; a sure proof that hystericism is not purely a cerebral affection, as some would have it. Venerèal desires frequently attend this situation.—These, when exalted, constitute nymphomania; to which may be joined regret for some cherished object, and chagrin at not being able to possess the desired individual.

The phenomena corresponding to chronic inflammation of the digestive passages, may be, and in fact often are, associated with the preceding symptoms.

All the individuals who are a prey to these different accidents, inflammatory and nervous, have a pre-disposition to insanity. When their state of morbid wakefulness, and their reveries in that state (hallucination) become the predominant symptoms, they are more than pre-disposed—they are in the state of incipient insanity ; that is, where the reason is hardly able to resist the suggestions of a too active imagination, and is in constant danger of yielding. We should place in the same line, and consider as already insane, those who in reasoning correctly, speak with great quickness and in a hurried manner, with brilliant eyes, the face colored, the features in motion, gesticulating, agitated, walking with great quickness, as if they had been excited by wine or by coffee. Such persons are very irascible—the slightest contradiction suffices to bring on a state of ungovernable anger ; a symptom which all writers on insanity, notice as the usual prelude.

All those unfortunate persons, whom long and serious disappointments, the loss of fortune, injuries against their self-love, or their honor, who are tortured by remorse, or by a desire of revisiting their native country, their friends, and all that is dear to them, render sorrowful, care-worn, solitary, and keep them in a state of paleness and meagreness, are connected with that double series of which I have already drawn the picture.

Infants, before ten years of age, are seldom exposed to insanity. They have too few ideas, and well formed opinions, to enable us to remark any permanent disorder. Those who are more advanced in this respect, are more exposed to it. But if the former have not any *intellectual* delirium, they have always as a substitute in their acute diseases, delirium of *instinct*, if I may so speak : that is to say, depraved appetites, tastes, and affections, which depend on the same causes as common delirium.

Women are more pre-disposed to insanity than men, owing to their greater irritability, and to a less developement of the encephalon, particularly in those regions which are appropriated to intellectual functions.*

* Not only Broussais, but all modern physiologists, with Gall, consider it is a fact beyond controversy, that the front part of the encephalon, from the orifice of one ear, round by the eye-brows, to the other ear, and across the head, from the orifice of one ear to the other, is the appropriate region of intellect : the back part of the head, from ear to ear, in both direc-

We may now understand how serious is the danger from retrocessions of external phlegmasiæ; from excess in liquor; from moral affections unattended to; from impatience; from the action of the sun on the head; from a temperature of body, suddenly reduced by cold: in all those persons who are exposed to the various conditions of the system here enumerated. The result of these may be a sudden exasperation of cerebral irritation, which produces an attack of furious mania. But of these causes, the most powerful are such as depend on intellectual excitement.

There are cases where insanity shews itself unexpectedly as the result of very strong moral affections—as an affront received in public on the part of some great personage, or from the effect of menstrual suppression; in short, by any accidental cause that acts violently on the nervous fibres of the encephalon, but which have not had time to modify profoundly the vitality of the vascular system, to excite a feverish diathesis, or to bring on any of those forms of incubation of which we have given a description. They announce the presence of insanity by extravagance of action that surprise those about them. The organs of digestion are not much injured at first, and the disease is more nervous and more exclusively cerebral than in the ordinary cases, although the irritation that produces it, is not perfectly devoid of inflammation, which never fails to take place in the course of a few days.

CHAPTER III.—CHARACTERS OF INSANITY.

Mania shews itself under several forms: it is acute or chronic—it is general or partial.

Acute mania—mania with agitation.

It is accompanied with fury or without: in the one or the other case it is general; and always at the same time instinctive and intellectual.

A. Acute, furious mania, is the highest degree of insanity; that which approaches to frenzy. It has been called acute delirium; but the highest degree of activity of delirium in general, is that which arises from acute inflammation of the brain, but furious mania occupies only the second rank of

tions, is appropriated to instinct, and to the passions. The developement of the parts being the same, there may be great differences among individuals, from more or less irritability of the nervous system.—*Trans.*

active irritation, though susceptible of a long duration—that is to say, it is sub-acute. It is always the highest degree of what we call insanity ; all the others are exalted to this when the patients are strongly excited : at least if they be not already worn out. Insane persons, in this state, are agitated ; they vociferate ; they are irritated at trifles ; and even without provocation ; and still more, if they are spoken to : It is sufficient to converse with them, to excite them to the highest degree. Their proposals are incoherent ; their eyes are animated ; their muscular force is prodigious ; they must always be under restraint, for they are governed by an inclination to break and destroy every thing they can seize hold of. They would kill the persons who would approach them, if these had not obtained the mastery over them. One of these insane persons, in whom the paroxysm had broke out suddenly, had already cut the throats of several persons, before they could seize and confine him : several turned their fury against themselves, and stabbed themselves, or threw themselves headlong : this is frequently their first act of delirium. Their pulse is small and concentrated, and more or less quick. Sometimes they have scarcely any acceleration in the pulsations of the heart. When they have not yet been blooded, we observe a red, puffy countenance ; the veins swelled ; a hot skin ; a red tongue ; confused sensibility in the epigastric region ; want of appetite ; sometimes a yellow tinge about the eyes. Patients may long remain in this deplorable situation ; without sleep, without food, without feeling the impression of cold, vociferating and blaspheming day and night, striving to break their bondages, and always dangerous, if they succeed in so doing. It is difficult to conceive how life can be supported at such an expense of cerebral and muscular innervation, as that which they are subjected to occasionally, during two, three, four months, in succession ; and sometimes for a year. Some of them, far from being weakened by two or three months of voluntary abstinence, still enjoy a muscular force, proportionate to the fury which transports them. To us, this is the most astonishing of all maniacal disorders, from the immense loss of nervous energy, which supposes a renewal from some source which we cannot point out. How can we conceive that a meagre female, who takes no substantial food, can remain for several weeks, half naked, in the depth of winter, with a feeble impulse of blood to-

ward the skin, a pulse small and concentrated, without catching cold, or suffering from rheumatism? This, however, is what we observe; and it can only be attributed to an increase of nervous energy which we cannot explain in the first instance. We must not forget that this kind of maniac always has the head hot, and by consequence, it is to a nervoso sanguine excitation of the brain, that they owe their power of resisting abstinence, cold, and pain. We are surprised, moreover, at the facility with which the contusions and lacerations which they inflict on themselves, are cured without any application; but when the patients are exhausted by a prolonged nervous excitation, their wounds and contusions easily become gangrenous.

The fury of this kind of madmen is always excited by a persuasion that they are attacked—that they are pursued—that their life is sought, according to one or more false narratives, or romances that their imagination fabricates without end; or from the aspect, the discourse, the menaces, the gestures, of imaginary beings, corporeal or spiritual, to whom they address their conversation; these are illusions, which are termed *hallucinations*. Most of the persons who introduce themselves to these maniacs, are ultimately ranked among their enemies and persecutors; and being so, they seek to destroy them. It would be wrong to suppose the maniacs entirely deprived of reason; they talk and act in many cases, consequently, upon the dreams of their delirious imagination; but their reasonings are so rapid, that it is not easy to follow them. Nevertheless, we are certain, from their confessions after cure, that their bad actions are not always the result of reasoning; but they are committed from impulses, organic or instinctive, and thoughtless; but this vice is more frequent in a species of insanity less impetuous than what we have described.

B. Acute mania, not furious. After mania, furious and agitated, we ought to rank another kind, where there is agitation, but without fury. We may remark in this form of mania, an incoercible propensity to agitation, by walking and gesticulating, a red face, sparkling eyes, a hot scalp, a power of resisting hunger and weakness, which indicates an excess of innervation on the assimilating viscera, and the muscular apparatus; a blustering loquacity, always founded like the preceding one, on the supposition of events that have never happened, whether gay or sad, or upon the sight

or accents of imaginary beings, to whom they address themselves, (*hallucinations*.) These patients are usually confined, but not bound, unless fury, and an inclination to destroy, should accompany the other symptoms, which sometimes takes place, by the sole effect of an increase of irritation.

The duration of this state is also very variable. These madmen, like those who are furious, often have a chain of predominant ideas, not always easily understood ; but like the former, their ideas wander upon all subjects ; and although they recognize the persons who accost them, they always judge ill respecting them ; for they associate these persons with the objects of their delirium ; ascribing to them antecedent actions and conversations, to which they are utter strangers. They have also the mania of being acquainted with persons they have never seen ; and of placing them as actors in their imaginary fictions.

Chronic Mania.

It is either general or partial, instinctive or intellectual, and often both the one and the other simultaneously.

Chronic Mania general. We speak now of insane persons, habitually delirious on all subjects, without being hurried on by a vivid agitation, like the preceding. This insanity is common when madness has already commenced ; but, before this epocha, the greater part of insane persons are governed by one predominant idea, or by a series of ideas ; but they can understand reasoning upon most other subjects, when they are not under the influence of their morbid agitation ; provided, always, that you do not exact from them much, or continued attention.

Chronic partial Mania, or Monomania. Partial mania, the *melancholy* of the ancients, and of M. Pinel, the *monomania* of Dr. Esquirol, is the usual chronic state of maniacs, both before and after agitation, provided they have not yet arrived at dementia. Monomania differs according as the patients are more or less reasonable on subjects foreign to their habitual delirium, and according to the kind of that delirium. There are many monomaniacs who cannot keep up a conversation on any subject, without recurring to their habitual series of ideas, with which they connect all new impressions of the senses, although they have perceived them very distinctly. These occupy a middle rank between the general maniacs, and the perfect monomaniacs, under exclusive delirium, which, like the hero of Cervantes, are

reasonable upon every thing not connected with their dominant idea. We shall see if the parallel holds in all points.

The classification of monomanias is difficult, if we would make it interesting and easy to be remembered. I will endeavor to connect them on the one hand, with the faculties of instinct and intelligence; and on the other, with sensations more or less oppressive, as well as with different degrees of visceral irritation.

1st. *Of instinctive monomanias, founded on the perversion of instinct, and the wants termed physical; either complicated with delirium, or not.*

We love or we hate men and things: these feelings may be perverted, that is, the one may be excited to the prejudice of the others, and this gives rise to different monomanias. I shall explain them, following the division of instinctive wants laid down in my *Treatise on Physiology applied to Pathology*, and considered in the first part of that work.

A. *Perversion of the want (or instinct) of self-preservation.*

Monomania of Suicide. This is sometimes simple without delirium, and consists only in a thoughtless impulse, or else seemingly at least, on some particular grievance. In fact this *tædium vitæ* is the result of some insupportable uneasiness, usually originating in a disordered stomach. But this viscus is not alone irritated: the heart and lungs are so also. The irritation is seated in the nervoso-sanguineous expansions of those organs; it is sent through all the nerves of relation; and it is the innervations of all these tissues on the brain, which renders existence a grievance, and urges these unhappy persons to their own destruction. All other motives are but pretexts. It will be necessary to distinguish this organic impulse to suicide, from that which depends on a moral cause producing despair, and from an aberration purely intellectual. Let us however return.

Another mode of perversion of the same want, creates *imaginary evils*. We may observe the first stage, as we have already remarked, in the hypochondriac incubation of insanity. The last stage is found in those monomaniacs who believe themselves attacked by incurable disorders, infections, or putrefactions; surrounded by devouring fires; conceiving that their legs are made of glass or of wood; that their head is of metal; that insects are biting them; that snakes gnaw their entails: they believe they are incapable of walking, because their legs are too weak or too fragile,

&c. &c. All these deliria are founded on the perception of some sensation more or less painful, sometimes slight and referred to the organs or limbs of which they complain. These sensations, during wakefulness, are framed into a romance by their perverted imaginations, just as asthmatic persons while asleep feel a rock pressing its weight upon their breast, or some monster endeavoring to strangle them.

B. Perversion of the instinctive want of muscular exercise, or of rest.

We have seen how the want of exercise and bodily agitation, may be singularly exalted in furious mania. This affection may be the predominant phenomenon among certain monomaniacs. There are others that cannot bring themselves to exercise any of their muscles; and who are kept in silence, and immovable by some inexpressible internal sensation, not depending on any cerebral congestion, or any paralysis. The moral affections also are perverted.

C. Perversion of the instinctive want of associating with other men.

This want is the source of friendship, of kindness, of compassion. The exaltation of this want produces a delirium, in which the persons affected do not cease to deplore that they are deprived of the sight of persons dear to them. They weep, they lament, to obtain their being restored to them; but they care nothing about them when they arrive, and speak of them as absent, although they recognize them as present, and invent conversations and actions relating to them altogether imaginary.

From the opposite perversion of this want, result cruelty, and the inclination to destroy; an impulse not founded on reflection, and condemned by the persons subjected to it—an impulse that tempts them to inflict pain, or even death, on those whom they love the most. This perversion, and that of suicide, are often found conjoined. The causes of these aberrations always belong to an irritation in the trisplanchnic apparatus, (great sympathetic nerve,) and above all, in the stomach, (of which the symptoms have been antecedently exposed,) acting upon the brain. This last viscus may produce a disposition to cruelty, by its original conformation; but in the morbid state, it is an uneasiness felt throughout the whole splanchnic apparatus, including also the brain itself; so as to render ideas of murder predominant in spite of reason. This horrible perversion may be considered as

that of suicide (A.) like a species of chronic anger and hatred, sometimes directed against ourselves, and sometimes against men and things. We have already seen it under a sub-acute form, in furious mania; while it is entirely chronic and devoid of feverish inflammation, in that shade of it which we are now describing: in fact it may be extremely obstinate, and conceal itself under the appearances of calmness, gladness, kindness, until the disordered person finds the opportunity of executing his dreadful purpose. Look at all the treatises on insanity, and particularly the great and important note which Dr. Esquirol, the best of our living authors on mania, has just added to the translation of Hoffbauer.

In a middle shade of irritation, the monomaniacs who feel these sentiments of aversion for their fellow-creatures taking place, condemn them and grieve at them. We find insane men, and more frequently insane women, who are in despair, that they cannot love their husbands or wives—their children—their relations; and who, on this account, feel themselves unworthy to live.

In its lighter degree, this perversion produces moroseness, impatience, and hatred towards certain persons—a state which we frequently meet with among children of different ages, and among many grown up persons, whose ungrateful and selfish character, skilfully concealed, discovers itself on the slightest painful affection, and particularly when the digestive apparatus is irritated.

The unhappy persons abandoned to this deplorable inclination, invent pretexts to justify their atrocities; sometimes it is a voice that directs assassination—sometimes it is God himself: some have believed they had a commission to save mankind by the baptism of blood; others pretend to secure the salvation of their children, and to make angels of them, by cutting their throats. Their rage is, for the most part, directed towards objects which are most dear to them; and when the murder has been committed, they coldly contemplate their victim, or occupy themselves about something else, according to the kind of delirium which coincides with their murderous monomania. When they have no other delirium but the impulse to commit murder, they put themselves to death, through despair of having committed it; or they go to a magistrate to confess it: there having been some who, in a state of delirium, have pretended that they have committed murder upon another, to procure that death

upon the scaffold, which they had not the courage to inflict upon themselves ; and to find time, in the delays of justice, to reconcile themselves to their maker. But it is clear, that in the majority of cases, these motives have been suggested to them, by the horrible state of visceral uneasiness, of which I have spoken ; and which exercises such a prodigious influence over the will.

There is no doubt, also, that certain forms of cerebral irritation may determine, originally, these two monomanias ; but even in these cases, the influence of a disordered brain produces a consequent irritation in the sub-diaphragmatic nervous apparatus ; for all authors agree in acknowledging the coincidence of irritation in the digestive passages, with those monomanias which urge on to murder or suicide.

B. *Perversion of the instinctive want of nutriment.*

The monomania which incites to the eating of strange things, sometimes very disgusting, as earth, charcoal, chalk, worms, insects, dung, &c.

We find the first degree of this monomania among chloritic patients whose stomach is irritated, and among some men with gastritis. This desire is almost always accompanied by delirium in mad houses, but the irritation of the stomach is not less real. It exists as *Boulimia*, where the appetite is morbidly increased, for these foul-feeding maniacs are not incommoded by ordure, which it gratifies them to devour.

The want of exoneration, which follows the taking of food, may also be depraved. Several insane persons delight in dirtying themselves while yielding to this natural want which is often coincident with the desire to eat their excrements, or drink their urine, &c.

E. *Perversion of the instinctive desire of generation.*

Erotic monomania of different kinds.—Some are troubled with priapism or nymphomania, and all their words and actions tend only to gratify their depraved appetite—others fall a prey to a passion quite moral ; such are often women of a gentle, melancholy character, well educated, who exhibit this shade of erotism : they are wrapt in contemplation of the perfections of the cherished object : they think they see, hear, touch him : they address him with tender expressions—sometimes in a gay tone—at others with tears in their eyes : they lament continually, and appear dying with grief at his absence, yet they would treat him coldly if he were

presented to them, whether they recognized him or not, for they might or they might not recollect him. Led away by the illusory images that occupy them, these insane patients do not substitute in their imagination the real persons who offer themselves to their sight. Sometimes they have the wish and the intention of doing so, as we shall see further on, especially when the question is as to the persons who take care of them ; but the internal storm of their diseased imagination seems to sweep away all the impressions of their senses, or associate them with the chimeras of imagination. All the monomaniacs governed by a series of predominant ideas, but not exclusive, are in this situation, and resemble herein the general monomaniacs. I shall, therefore, not dwell upon these at all, in treating of the monomaniacs of whom I have yet to speak.

2dly. *Intellectual monomaniacs, or persons that are such from the perversion of moral wants, with the predominance of one idea, or one series of ideas acquired.*

The desire of observation (curiosity) which manifests itself among us after the physical wants are satisfied, becomes by exercise so powerful as to get the better of some of those wants. This desire is developed, as we have shewn in our Physiology, and in the first part of this work, in proportion as the cerebral apparatus dedicated to intellect, becomes developed. It is this curiosity that procures for us all those ideas that we derive from external objects by means of our external senses ; and it is owing to the pleasure we experience in observing all the bodies of nature, and discovering what we deem their natural relations, or truth, that we become passionately addicted to intellectual labor. This passion becomes stronger as our organs of intellect become more developed ; but do what we will, we shall never be able perfectly to insulate the perceptions that arise from instinctive wants from those which depend on curiosity respecting external objects. Hence it is, that the original perversion of instinct draws with it that of intellect, a fact settled in the first section on insanity ; for the same reason we shall see instinct perverted in the monomaniacs of intellectual origin, as a consequence of them.

A. Monomania founded on self-satisfaction.

If the *pleasure* (a physical sensation) attached to self-satisfaction, be the prime mover of all our efforts to exalt our intellectual faculties, the morbid exaltation of this pleasure,

ought to constitute the principal monomania of intellectual origin, the *monomania of pride*. We observe this among a great number of those who become insane from excess of mental labor and study, whether they have been inflated by success, or discouraged by insurmountable difficulties. But we extract vanity from many other things than our intellectual riches. Man is proud of his strength, of his youth, of his health, of his comeliness, of his fortune, of his power, of his warlike exploits, in a word, of every thing that he finds in himself comparable with what he sees in others. If man has not always the pleasure of triumph, he has always the desire for it; and he cradles his imagination in the enjoyments he can derive from the castles he builds in the air. The monomanias are, in fact, nothing but the realizing of this castle-building: with some, because their self-love has been satisfied; and with some, because it has been opposed and wounded. The first set when they become insane, only continue to dream of the happiness at which they aspire, and to pride themselves on their advantages; the others, after many obstacles humiliating to their pride, are left to dream at their ease, after getting rid of their troublesome reason.

Remark, however, that this delirium of happiness—this paradise of proud madmen, can only continue until some uneasy sensations felt in their principal viscera, overturn it.

The varieties of monomania, founded on self-satisfaction, or moral contentment, are numerous, and they are the most common. The nature of this delirium is determined by the opinions imbibed during education, the circumstances continually under their eyes, &c. These monomanias consist in believing that they are God, whether of the christians or the pagans, (no doubt the Mahometan madmen believe themselves often to be Mahomet,) in considering themselves as a spirit, an angel, a demon, a genius, a king, an emperor, a pope, a prince of the blood, a hero, a great nobleman, rich, opulent, learned; in believing that they have made great discoveries, &c. These monomaniacs assume the tone, the language, the attitude, the gesture of the personages they represent; they copy so perfectly the dignity of potentates, that one would almost believe them elevated to a throne; a proof that such persons have profoundly studied, while in health, the character they assume when in their state of disorder.

At other times the satisfaction of the sentiment of self-love, is announced by the external signs of *vanity*. One adorns himself, and calls for admiration of his elegance; others, especially among the women, are eager to dress themselves, and see the most elegant specimens of attire in dirty ribbons, and ornaments in every article of wood or of metal they can lay hold of.

B. *Monomania founded on self-dissatisfaction.*

We place it here as the opposite to the preceding form. Those who are seized with this delirium conceive themselves to be despised, humiliated, justly prosecuted, culpable in a high degree, bent down by judicial decisions, and unworthy to live. If religious ideas have much occupied them, they apprehend themselves to be objects of divine wrath, pursued by Satan, or having him dwelling in them, or that they are plunged into the burning lake. We see some of them under contortions and howlings of which they have taken the notion from pictures, books, and sermons, representing the torments of the damned. This form is what is termed *demonomania*. Fanaticism, and the dread which persons of weak heads experience on seeing the contortions of people who pretend to be possessed, are sufficient to give rise in them to the same delirium. It is in this way that demonomania has been seen extensively propagated and in some sort contagious in the middle ages, particularly among females.

One may easily conceive the conversation held, and the attitudes assumed by different forms of this kind of insanity, as the patients are impressed with their supposed suffering under this or that kind of misfortune. One, fearfully looks at the enemy or the monster that pursues him; his eyes are haggard, his face distorted, his hair upon end; it is dreadful to look at him. Another, conceals himself—a third sends forth groanings—a fourth rests in silence and consternation. I knew one of these, (a female,) whose whim was to believe herself ruined, and she was in consequence in the greatest humiliation; she would wear rags only; she would feed only from porringers of wood with a tin spoon, and keep her feet naked; her countenance was sad, tears were in her eyes, she spoke seldom, unless those who attended her refused credence to her pretended ruin.

All the monomaniacs of this series, have a strong and permanent irritation in the digestive organs, and the signs of it.

are manifest. But this irritation may be the result of melancholy ideas.

We have seen ideas acquired through the senses, which have become accidentally predominant, induce a lesion of that inward satisfaction or motive, that sustains curiosity. Let us now proceed to cases of monomania, or other trains of ideas, become predominant, and exciting either pleasing or unpleasant feelings, in which the lesions of this want are not predominant.

C. *Monomania of Gaiety.*

To the first form belong the monomaniacs who, being actuated neither by pride or vanity, appear gay, content, always smiling, always happy, whether it be from a persuasion of wealth, of power, or of place ; they think they produce the good fortune of all who approach them, whether from their influence with supernatural beings whose protection affords them all kinds of felicity, or that they believe themselves already in possession of a spiritual world.

D. *Monomania of Melancholy.*

In the second rank I place all those melancholy monomaniacs, who are devoid, however, of the feeling of humiliation consequent on wounded self-love ; a circumstance of importance, because the visceral sensations are not so painful as in those melancholy deliria attended with feelings of shame and guilt. All the monomaniacs of this section, believe themselves persecuted without just cause, ruined, condemned by what men call justice ; or else they are exposed to cruel animals, or they are fugitives, abandoned and without resources ; in short, they are in various ways unhappy, but always satisfied with themselves. They have not all these ideas at a time, but one or other adapted to their particular circumstances, and which occupy them exclusively. This is the Melancholia of the old physicians, the Lipomania of Dr. Esquirol.

The class of avaricious monomaniacs ranks here ; for they are under the domination of a series of ideas more melancholy than gay. If the avaricious man enjoys, it is only through a long prospective, or from the contemplation of his treasure ; but this joy is poisoned by the fear of losing it ; and this fear becomes the predominant sensation. Having no self-persuasion of guilt, these insane people never believe themselves possessed by the Devil, but are able, like St. Anthony, to set all his snares and temptations at defiance.

they are always sorrowful, more or less; but not in despair, like those who are subject to self-reproach, and believe themselves not worthy to live.

E. *Complex Monomania.*

A third form of this species of insanity ought to be admitted, for the monomanias founded on a complex series of ideas, and calculated to excite alternately joy and sorrow, hope and despair, pride and humiliation, fear, and its reactive movement, anger, &c. These are the series of ideas that alternately predominate in many circumstances where a man's life is agitated by what is called ambition, jealousy, envy, and above all fanaticism, a kind of feeling nourished by pride, by anger, by envy, and all the most agitating intellectual emotions. They are rather the causes of insanity than the objects of it; for the persons afflicted do not retain them while ill, in a form so complicated as before their malady. Generally, one fixed idea predominates among these insane persons, who are neither agitated nor in a state of dementia, because the morbid state of the encephalon produces the same series of ideas while it remains in that state; and the diseased do not enjoy the aid of reason to repel this series, or to induce the successive predominance of other recollections, and to compare them with present impressions.

As this state may exist under various shades, we are compelled to admit it here under the title of monomania of a complex character; that is to say, founded on the predominance of one series of ideas which gives rise successively to opposite sensations.

F. *Intellectual Monomania, without the predominance of internal emotions, agreeable or painful.*

After the monomanias, where the pleasure or the pain are of moral, that is to say of intellectual origin, although the emotions are truly visceral, and act a distinguished part, I place those where acquired ideas become predominant, occasion neither pleasure or pain sufficiently marked to constitute an unhappy complication. These monomanias are only singularities more or less surprising, which amuse the spectators rather than afflict them. Of these, are the persuasions in the patient that he is a dog, a wolf, a cat, or some other animal, whose cries and allures he imitates; in supposing he is transformed into a stone, a bottle, a grain of mustard seed, &c. These kinds of transformations are innumerable: they are sometimes founded on certain changes

in the functions. Thus an insane man, rendered powerless by masturbation, believes himself transformed into a woman, and wishes to assume the tone and costume of a female. The legs of glass, the belly of paper, the heads cut off, the hearts torn out, the supposed bad smell of the body entirely dissolved, the spirits that haunt him, the wantons that flit about the madman like flies, the lilliputians that by millions climb up the legs of one of these persons, who thinks that at each step he crushes them by dozens ; and other reveries of the same kind, may depend upon painful sensations, but are not sufficiently strong to induce us to regard the disease as of instinctive origin. We find, however, in all these, a predominant irritation of the brain, which obstinately reproduces certain ideas at the expense of the recollection of different ideas, and of actual impressions.

We must place in the same rank, all those madmen who are incited to perform constantly certain movements, either of gesture or of progression ; to pronounce obstinately certain words, or to keep silence for a long time—sometimes for years , to give themselves up to a certain kind of labor, whether mechanical or of writing, whether of describing plants or animals, of chemistry, astronomy, the drawing of plans, translating, versifying, &c. &c. These monomanias are so numerous, that we should be lost in the classification, if we did not confine ourselves to referring them to some intellectual lesion, and the predominance of some acquired ideas, depending on some regular mode of cerebral irritation, unaccompanied by any great alteration of an intrinsic want of the first order, or by any special want which compels us to observation and comparison.

As monomanias depend on some mode of cerebral irritation, when this mode changes, the monomanias change also ; the loquacious madman becomes suddenly taciturn, and vice versa. To sorrow succeeds gaiety ; to a phrase for a long time pronounced, some other phrase ; to one attitude, another attitude, &c. There is no fixed duration for any of these forms of mental aberration.

It is in vain that some persons assure us, that there are monomaniacs who are perfectly reasonable on every thing except their predominant trains of ideas. They can reason justly upon questions merely relating to their physical and common circumstances ; but the most accurate observers agree, that none of them can sustain a serious conversation

which requires attention and discussion ; or treat by writing any question of morals or philosophy, general or special,* without falling at least into false reasonings. This is a fact we must not forget : there are no perfect Don Quixotes ; and whatever may be said, he who cannot apply his reason to a subject so important as his own proper position in society, is incapable of reasoning justly upon any question of a higher order. These monomaniacs, then, are truly madmen ; as we may be convinced by compelling them to reason : we see immediately that they become disconcerted, or confused ; or irritated, and show a tendency to general mania : the least degree of insanity of which they are capable, is that where their different instinctive wants, such as we have already detailed, are but little changed ; so that we can employ these patients in some manual operations that do not require a sustained attention, or any complicated intellectual combination, such as some mechanic art, gardening, some simple game, music, daily domestic occupation, &c. provided no great responsibility attaches to them.

We must remember also that in the monomaniacs that appear most limited, there is always a perversion of the affections and feelings that have been most durably, and most powerfully cherished by the patient ; I mean the love of their relations. This may be expected ; for these subjects are not insane, as in the case of general insanity, but because they are seduced by false perceptions which attract all their attention, and do not permit them to substitute the real perceptions furnished by the senses, nor the recollection of past sensible impressions. Hence it is they forget their relations, or hate them as persecutors, and the first sign of returning sanity, is the return of those affections of the heart, and the acknowledgement of those cares to which convalescents are indebted for their cure.

If we were only to consider those actions which madmen can commit in consequence of the alteration of their intellectual faculties, we should make a bad classification of their monomaniacs. For example, a madman who believed himself to be the Emperor of Austria, heard some one call his physician who wished to impose on him as Emperor of China : thence forward he believed his doctor came to dethrone him, and he took the resolution to kill him by surprise, and preserve his own crown. Here is an accidental

* Important in medical jurisprudence.—*Trans,*

assassination not dependent on the monomania of murder. Insane delirious persons may have a thousand such motives for killing either themselves or others without the monomania of murder being their ruling propensity. One of them strikes his friend, thinking he strikes a demon or a monster who pursues him; another stabs himself to the heart to avoid a shameful death on the scaffold which he thinks waits him, and to save the honor of his family; a third sets his house on fire because he thinks it has become the rendezvous of robbers, &c. &c. Hence arises a necessity to inquire strictly into the motives of an accused person, not only to decide on the degree of his culpability, but also to determine the seat of the malady and the most efficacious remedy. As the passion which has given rise to the insanity does not always remain predominant after the loss of reason, so the monomania sometimes changes, and this implies some change in the affections of the different organs diseased; but these changes are no more than the variations and irregularities of a continued malady. It is not so with the following class.

INTERMITTENT MANIA.

Every form of mental affection that we have described, may become intermittent, re-producing itself periodically, provided the irritation on which it depends has not altered the texture of the brain or the viscera of the lower belly; it is this that renders insanity intermittent. Many accessions recur several times in the course of the year; others only once, and at certain times, as spring, autumn, &c. A lady has had fits of insanity for three or four months annually during thirty years, and they have never passed an interval of six months without re-appearing, though they have been sometimes retarded for two or three months. Aware of the return, she retires to some lunatic asylum where she is confined during the access of her disorder. During night she sees the most tragical scenes of the revolution of which she had been an eye witness; she sees the executioners, and as formerly, she is sprinkled with the blood of the victims; she is afflicted and cries out with all her force. Scarcely does day approach, than her delirium changes its type: it becomes gay, indecent, and even gross. At night the scenes of horror appear again, and so on during the periodical access of the fit. She holds the same kind of discourse, offers the same injuries, apostrophises those who

attend her in the same language, and every symptom is exactly the same at each recurrence of the fit. When that is over, she becomes reasonable, returns home without losing the recollection of any thing she has done or said, and enjoys her reason perfectly till the next return of her disorder. During the prelude of her last access, in 1827, she received news of her husband's death, from whom she had long lived separate. The access of her disorder was stopped; but in two months afterwards she was seized as usual.

CHAPTER IV.—PROGRESS, DURATION, COMPLICATION, TERMINATION OF INSANITY.

Insanity, like all other non-specific irritation, has no progress independent of modifiers, nor any fixed duration, like the small pox, the measles, &c. It may be cured suddenly by medical skill—by nature, which re-establishes a function which has been interrupted, or transforms insanity into some other bodily affection—by chance, which dissipates it by means of some lively moral impression. This is very possible when the inflammatory state is not present, so long as the substance of the brain is not disorganized; and this state may be of long duration. It may also be indefinitely prolonged without amelioration, or only with remissions, and end in madness: this occurs in the greatest number of cases, when the disease has not been efficaciously combated at its commencement.

It is, above all, with the progress of insanity which medicine has not arrested in a short time, that I must now be occupied.

The inflammatory symptoms having been mitigated by art, the patients continue disordered in their senses, each after his manner; that is partially on the same subject, or when the object and the subject are changed, during a greater or less length of time. This time varies considerably. Some are cured at different epochas during the two first years, even under the care of physicians who use active remedies. We have seen reason return after ten or even twenty years of mental alienation: this proves that the integrity of the brain may be preserved for a long time in some favored subjects. Many other viscera offer the same cause of remark; but one is less surprised in those cases than when a substance so delicate as the brain gives rise to it. In general, writers on mania (Esquirol) do not count upon a

cure after the second year ; the most ordinary period within which a cure may be expected is from 50 to 150 days.

When insane patients do not return to their reason, they fall into that kind of madness which consists in the loss of intellect (dementia) and into general palsy, unless some complicated disease abridges their life ; for they are exposed to all the maladies that afflict other persons. As they do not possess the power of resisting cold, except during the state of insane excitation, and few precautions are taken to secure them from the effects of it, they often suffer much from this cause. Hence pleurisies, peripneumonies, and pericarditis, which may carry them off in a few days : hence, also, an habitual state of pulmonary congestion, accompanied by bronchitis, which may have dangerous results : hence most insane persons become rheumatic or gouty, deprived of the use of their limbs ; or else these affections suddenly ceasing, they are replaced by suffocating irritations of the stomach, the lungs, or the heart. Acute gastro-enteritis and intermittent fevers, do not spare insane people, and often depend on the cold damp state of their habitations.* But of all the accidents to which they are liable, because it is the most suddenly fatal, is the congestion of blood in the brain, which kills them suddenly, and occurs often in an attack of epilepsy. Many fall victims to phthisis pulmonaris, and we shall soon see the reason ; but the greater number die of chronic entero-colitis ; for the disposition to acute gastro-enteritis cannot last long. This affection comes on with diarrhœa, and colicky pains, which plunge the patients into marasmus, leucoplegmasia, and slight effusions in the peritonæum.

Insane people do not arrive at this state of exhaustion until they have long suffered by chronic affections of the upper portion of the digestive canal. Generally they do not complain much ; but their gastro-duodenitis may usually be distinguished by the yellow color of the conjunctiva, and the mucous and bilious state of the tongue, or the tenderness of the right hypochondria into which the liver often pours its fluids ; and by a pain more or less obtuse on pressing the epigastrium, or the right or left sides under the ribs. It is after this state has long continued without preventing the nourishment of the patient, that diarrhœa appears ;

* In England and this country, all the train of accessory disorders here enumerated, are obviated by the introduction of heated air.—*Trans.*

sometimes preceded by an œdema of the malleoli, or a slight fluctuation in the abdomen.

If the insane patients uncured, do not contract any of these accessory diseases, they may arrive at an advanced age even while insane ; but they never afford instances of great longevity, for they are in fact diseased ; and those among them who have long enjoyed a state of good health, are the only persons who live long. Some have lived in a state of insanity during thirty years. During this long period, many causes influence their delirium, and some of them exhibit short lucid intervals. Every thing that irritates them disorders their ideas, and tends to bring on a state of agitation, fury, and general delirium, when it is not of itself continuous. The spring, the autumn, great heat, biting cold, are the most frequent causes of these exacerbations. Electricity also excites them much, and threatens to induce even cerebral congestions, if the patients are plethoric : all these types of disorder are from the beginning, or become with time sensible to atmospheric changes. Contradictions, disputes, earnest discussions, numerous visitors, the sight of popular meetings much agitated, freedom allowed too early, wine, alcoholic liquors, and all the diffusible excitants, agitate them strongly and impede their cure. Such also is the case with tonics improperly exhibited, and generally with all irritating medicaments, which false medical notions may prescribe, unless in cases of accidental weakness, well characterized.

Insane persons indulge in solitary excesses which greatly influence the progress of their disorder, by powerfully stimulating the heart, and determining congestions of blood in the brain. This cause is one of those which concur in producing among them aneurism of the heart and epilepsy, one of the most unfortunate complications that can befall them.

I have said that dementia and general paralysis were reserved for insane persons who have neither been cured, nor cut off by the complications before mentioned. Let us now see how these affections exhibit themselves, and narrate the history of mental alienation (dementia) more particularly, that type which constitutes the last form of insanity.

DEMENTIA AND GENERAL PARALYSIS.

This is announced by three classes of phenomena, which correspond to the three great functions of the encephalon : loss of intellectual faculties ; loss of muscular motion ; loss

of the functions of the senses. The first constitutes what writers on mania have agreed to call *Dementia* : the second and third have always been regarded as Paralysis. Hence we are induced to join the history of mental alienation, (dementia) which constitutes the last form of insanity, to the facts which relate to general paralysis.

The presence of epilepsy hastens the approach of dementia, which may appear as the immediate consequence of epilepsy, without any preceding insanity. For insanity has not the exclusive power of producing dementia, which may succeed to obstinate head-aches, to long continued intellectual labor, to much watching, great efforts of memory, apoplectic form sanguineous congestions, repeated attacks of the palsy ; we see it come on by degrees among persons who have remained in a state of hemiplegia, or deprived of some of their senses after recovery from one or more apoplectic attacks. It is equally developed in those who are palsied in one of their senses, or in some of their muscles, without having experienced any complete attacks of apoplexy or hemiplegia, or who have been subject to that kind of attack without hemiplegia, which authors have called a sudden plethora of the brain, (coup de sang.) In short, dementia declares itself in the progress of old age in persons whose cerebral organization is imperfect, or who have too much abused that viscus.

We have paid great attention to the dementia of *old age* ; we have observed it often in those families, particularly, where the brain has not been very robust, and wherein insanity has appeared at an age not much advanced. This is a true chronic irritation of the encephalon, more or less inflammatory. It is with the irritations of the brain, as it is with that of other organs : among the subjects who are born with a pre-disposition to chronic pneumonia, gastritis, or articular inflammations, the more weak, the more irritable, the more stimulated, contract this disorder in their youth, while the more robust and the least irritated, contract it only in advanced life, and when time has triumphed over their vital energy. This truth would be a melancholy one, if there were not a middle term reserved for those who know how to use the means of preserving health (hygiène) so as to withdraw themselves from the determining causes.

Dementia announces itself in various ways, as it is simple or complicated with insanity, or with general paralysis. The more simple form is that of old men who are neither insane or paralytic; it shews itself by an incoherent loquacity, with repetitions that mark the feebleness of memory. The persons affected, are subject to occasional hallucinations, signs that irritation is at work on disorganizing the encephalon; they weep, they laugh, they sing, they invent stories; but in other respects appear to be in health.

The dementia of persons already attacked with insanity, is also recognized by want of memory, by incoherence of conversation and proposals, and frequently by vacancy of countenance, and stupid silence. But what is very remarkable, is, that the moment when they fall into imbecility, and lose that sombre and haggard look that expressed their cares, and that pale and worn figure so usual among all of them, they appear to gain astonishingly as to all their internal functions; they become fat, fresh, with color in their cheeks, and enjoy the best health in the world, while no disorganization of the stomach or the lungs is opposed to the healthy progress of nutrition. We see them walk alone, holding unmeaning discourses with themselves, but without agitation or fury; sometimes they are taciturn, looking stupidly at persons who accost them, answering only by monosyllables to questions put to them, seldom properly, unless they relate to their most indispensable wants. Those who are less affected, make remarkable efforts to connect their ideas, but when they are compelled to hear and to answer, and they become impatient at their want of success.

Such, also, is, for the most part, the progress of dementia in persons who have been conducted to this state by epilepsy. But where it proceeds in company with palsy, there is an embarrassment of speech as well as of memory. The persons affected pronounce some syllables with difficulty, they hesitate in talking, and they are at a loss for the expression they want to use. A difficulty also is seen in lifting up their legs, which feel heavy and benumbed; if they turn their head aside while they walk, they stumble and are liable to fall. By degrees the face loses its expression; they become indifferent to what passes around them, and seldom speak. They arrive at last at that degree of carelessness and stupidity, that we see them remain immovable, silent, and sitting or laying down for days together.

If general paralysis has proceeded at equal pace with dementia, the patients are at length deprived of the power of executing any voluntary motion, their food must be put into their mouths, and they must be kept constantly clean. In this degradation of the functions of external relation, the motion of the muscles of respiration and deglutition, remain during life.

Dementia shews itself without any kind of reaction by the perfect silence and stupidity in persons who have long been hemiplegic, or afflicted with chronic gastro-duodenitis. But a paralysis of one sense only, without being complicated with the loss of muscular action, or the disorganization of the principle viscera, does not prevent dementia from producing that loquacity which we have before noted. All the subjects whom apoplectic attacks have left impotent and deprived of the use of one side of their body, are those who pass as *weak-headed*; they become angry, they weep, they laugh at trifles, although they are in appearance reasonable: this may be considered as the first degree of dementia.

While this form of disease is not yet far advanced, that is, while it does not yet approach that silent stupidity which corresponds to its highest grade, it may present complications or alternations of intellectual excitation, forming a remarkable contrast with the stupor which usually characterizes it. Hence we are surprized to hear a man whose want of memory incapacitates him for regular conversation, play at chess, or perform on an instrument, as well as a reasonable person. The attacks of excitation seem to come on spontaneously at irregular periods, without any assignable cause, or at regular times, as at periods of menstruation; and the patients appear to become for some time agitated in the manner that approaches to curable mania; but a little attention will prevent the physician from being deceived.

The duration of dementia, is not determined more than other shades of mental alienation. When it is single, the brain does not experience much deterioration, for we see persons of weak intellect who are for years in this unhappy state; but the addition of paralysis, renders the prolongation of the disorder more difficult of cure.

We have already said that general paralysis may break out with dementia; but this may either precede or follow at different intervals. Persons of different ages, but especially

at the decline of life, after having undergone great intellectual labor, mental troubles, and long continued cephalalgias, who have had falls or received blows on the head, spine, breast, or pelvis, experience muscular pains, and difficulty of walking, as well as of pronouncing certain words, a long time before they perceive a loss of memory or any approach of dementia. I cannot stop longer on the details of such cases, whose progress I have just noted. I shall confine myself to paralysis considered as a termination of insanity; but this paralysis may be precedent or consecutive upon dementia, although it be more usual to observe these two affections commence and proceed simultaneously.

When paralysis appears before dementia it is always accidental, shewing itself as the consequence of violent head aches, some sanguineous congestion, or some attack of epilepsy or apoplexy. In these cases it is usually partial, confined to one side of the body where the muscles cease to act, or to one of the external senses that no longer gives rise to perception. Such a partial paralysis accelerates the approach of dementia much slower than general paralysis. This last, when it is the result of insanity, always keeps company with dementia, following the course we have already described.

When insane persons are not suddenly carried off, whether by violent apoplectic attack before or after the appearance of dementia, or by acute inflammation of the chest or the lower intestines, they perish miserably: sometimes in the immobility of dementia—sometimes with gangrenous eschars of the sacrum or trochanters, or by palsies of the bladder or rectum, when the affection of the brain is transmitted to the spine—sometimes before this period, by a chronic affection and disorganization of the lungs and digestive organs, as we have before observed. A great number go off in pulmonary hectic, from not having been sufficiently protected against the impression of cold. Those who are thus cut off, are affected also with a chronic gastro-enteritis, which puts an end to most of those who do not die of cerebral congestion, or of consumption; it is essential to chronic irritation of the encephalon to bring on these affections and disorders of the digestive apparatus. This gastro-enteritis, always accompanied by affections of the liver, kills the patient with marasmus, and diarrhœa when the disease extends to the large intestines; and sometimes in a state of dropsy,

which conceals the meagreness of the body, and the consumption of the last stage of life. Insane persons who have contracted rheumatism and its pains, often perish by aneurism of the heart joined to affections of the other viscera. This aneurism, the effect of irritation, may moreover exist independently among the insane, as among other persons.

CHAPTER V.—NECROSCOPY OF INSANE PEOPLE.

According to some physicians, the post mortem examination of persons who have died insane, have taught us nothing concerning the seat or the nature of insanity ; but many others are of a different opinion—they assure us that the brain always exhibits appearances of disease, of which mental alienation has been the effect. We shall give an account of the state in which the different organs have actually been found after death ; and the dissertation which we shall offer on the value of the symptoms, the diseases on which we have made our observations in the preceding pages, will aid us in determining the physiological character of insanity.

We must seek for the alterations that correspond to insanity first in the head. It has been found in the cases of persons who have died in transports of fury that the cerebral substance was injected with blood, and of unusual hardness. As to myself, I have seen in the body of a young man of 18 years of age, the nerves so hardened at the points of insertion in the brain, usually called the origin of the nerves, that they might easily have passed for small tendons. If such subjects die of violent apoplexy, we find moreover effusions of blood at the surfaces, in the cavities, or in the very substance of the brain.

When madmen have lived long, we find alterations still more varied ; but authors have not distinguished sufficiently the subjects who have been cut off by accidental death, prior to the access of dementia or general paralysis, from those who have undergone all the stages of mental and muscular deterioration. The organic disorders that have seized upon them, have proceeded from the external to the internal parts. The inequality of bulk of the two portions of the head—the thickening or thinning of the scull ; in case of thickening, sometimes the two bony tablets separated, leaving between them a considerable diploe (cellular tissue) ; the scull sometimes compact and smooth like ivory, and

when not so, frequently injected ; when it is thin, it is sometimes hard and sometimes brittle, and even friable ; the dura mater hardened, thickened, and ossified ; the arachnoid coat thickened, opaque, sometimes adherent, sometimes covered with a purulent layer, more or less dense ; the membrane of the ventricles thickened, purulent, adherent to the brain ; the pia mater injected with blood and serum ; sometimes thickened and united to the arachnoid ; we are principally struck with the adherence of the pia mater to the surface of the brain ; so much so, that in some subjects it could not be separated without carrying away some of the grey substance ; the circumvolutions obliterated and pressed against each other ; when on the other hand the pia mater was moist, these circumvolutions were separated, thinned, and the intervals filled with the lymph that moistened that membrane. We have seen the substance of the brain shining, and as if it had imbibed a serosity which rendered it moist when cut ; sometimes the grey substance has been harder than usual, which ought to correspond with the more than ordinary developement of the contiguous vascular membrane, the pia mater. The grey substance has been sometimes hard to be distinguished from the white ; a lively red tinge has been remarked in cases where the disease has been not much removed from sudden and acute, and in other cases a marbled appearance, more or less livid or pale, occupied the periphery of the brain, and almost confounded the two substances : the substance of the brain is found usually more dense than that of the cerebellum ; but both the one and the other unusually softened, especially in those subjects who have been attacked by epilepsy or general paralysis ; partial softenings or hardenings of the cerebral substance appear, which to some observers have seemed glandular or schirrous ; sometimes suppurations or ulcerations of a cancerous character, appear at the external surface, or in the cavities of the brain ; bladders filled with hydatids in the plexus choroides, sometimes hard and almost stony concretions in the foldings of this membrane and in some others, and even the pulpy substance itself, where now and then we find considerable petrifications, or bony masses, effusions of blood or serosity accompanying the alterations in the chronic, as well as in the acute state ; the general volume of the encephalic mass much less considerable in the first case than the last. Where general paralysis has occur-

red, we have found in the membranes of the spine, the same kind of lesions as in those of the encephalon; and sometimes important alterations in the medullary substance and the nervous cords.*

The alterations which the other organs present, do not differ from those which are found in subjects which have not been attacked by insanity. The insane, as we have seen, frequently contract chronic inflammations in the organs of respiration and circulation; it is not extraordinary, therefore, to find among them aneurisms, lungs hardened, ulcerated, or tubercular; the pleura and the pericardium altered, or containing an effused liquid. It is more common to find alterations of the digestive organs, accompany alterations of the brain: we always discover, therefore, in the abdomen of madmen, who have passed through all the shades of intellectual degradation, traces of chronic gastro-enteritis, with degeneration of the liver; that is to say, we find the internal membrane of the stomach red, brown, black, thickened, ulcerated, ecchymosed, rarely thinned, softened, or destroyed near the shallow part, unless the gastric symptoms have acquired the predominance, which we have seen more than once. We find much more frequently the duodenum reddish, brown, dilated; its internal membrane thickened, presenting follicles tumified, degenerated, ulcerated; the liver yellow, fat, augmented in bulk, or tough, sometimes tubercular, schirrous, containing cysts with serous effusions in the peritoneal cavity. The rest of the digestive canal is more or less altered in its mucous membrane, according to the degree of inflammation which it has undergone; the internal membrane of the colon, brown, black, full of small circumscribed ulcerations, as if made by a punch, especially among those who have died with diarrhœa. We also find traces of chronic inflammation in nymphomaniac females; but it would be useless to describe all the other disorders which may possibly be traced in the dead bodies of insane persons; for as these patients are exposed to the action of cold, and of the passions, sources of a thousand evils, it would be necessary to describe the pathological anatomy of most of the disorders of the human race.

* I refer to the excellent treatise on Insanity, by Dr. Calmeil, entitled "On general paralysis in insane persons." (*De la paralysie generale chez les alienés.*) Sagacity and indefatigable patience belong to this observer, who seems destined to settle this part of pathological anatomy.

CHAPTER VI.—ON THEORIES OF INSANITY, ANCIENT AND MODERN, UNTIL THE INTRODUCTION OF PHYSIOLOGICAL MEDICINE:

Now that the more ostensible facts relating to mental diseases are known to us, we may proceed to the investigation of facts less evident, which constitute part of the laws of physiology, and which may serve to explain the former. It would be useless to dwell on the absurd opinions respecting insanity which have prevailed during ages of fanaticism and superstition. In the Catholic persuasion, ignorant people have always exposed themselves, by an inclination to ascribe insanity to demoniacal possession, as the pagans often explained it by being besieged by the furies. But let us pass over these miserable notions.

From time of old, insanity has been considered as a disease of the brain; it has been compared with frenzy; and ascribed, like that, to inflammation of the brain, and its meninges. We find all these ideas in Cœlius Aurelianus, the translator of Soranus, as well as a therapeutic practice devised to perpetuate them; such as the application of leeches, cuppings, and scarifyings to the head, to the nape of the neck, and to the shoulders; a cooling regimen, simple diet, revulsive stimulation upon the skin, &c. It is surprising, that modern physicians should claim the honor of this discovery. In truth, other ancients not less famous, such as Galen and his followers, had drawn off the attention from the real curative indications, to fix them on humors to be evacuated, particularly the atrabilious; but this class of humors were always supposed to act upon the brain, and sometimes even to produce inflammation in it, as these Galenists acknowledged; but this explanation, admitted by all the mechanic humoralists, by Boërhaave, Van Swieten, &c. has prevailed even to our day. We have reason then to be astonished that the moderns have been so slow in substituting inflammatory lesions of the brain to the vague humoral lesions of the antient and middle age.

This delay has arisen from their having too much circumscribed the phenomena of inflammation. Considering phlegmon as the type of this morbid state, and requiring almost always suppuration to characterize the phlegmasia which do not terminate in gangrene, they have till now prevented observers from yielding the testimony of their senses to the proximate cause of the redness, the swelling, and the sense

of heat which they see in so many instances. Whenever irritation acting on a secreting organ, increased or denaturalized the humor furnished by it, this was regarded as the cause of the local affection ; and if any other part, however distant, presented a morbid state at the same time, it was ascribed to the aberrations of the same humor. Thus it happens, that the transpiration, the bile, or the mucus under the name of phlegm, have become causes of so many disorders which were not attributed even to the blood. On the same principle in later days we have seen that all the affections of the viscera that succeed to suppurating lesions, whether simple or ulcerous, are placed to the account of purulent infection.

The same tendency to generalize a few observations more or less exact, has shewn itself under different forms every time that some important discovery has been made. The circulation and pretended globular form of the particles of the blood, begat the mechanic, the hydraulic, the hydrodynamic theories ; that of the glands, and still later of the absorbent vessels, gave occasion to attribute all maladies to lymph, to glandular obstructions, infractions, or inflammations of the absorbent vessels ; the discovery of muscular irritability and the labors bestowed on the nervous system, drew medical attention to that quarter, and almost all our maladies were then placed to the account either of some original lesion of that vital energy of which the nerves were the agents, or of that subtile fluid of which they were the conductors, or else of the nervous fibrils whose degree of tension* explained all phenomena to that class of observers who did not admit of a nervous fluid.

About the same time we saw the archæal abstractions, the soul material and immaterial, energy or weakness, entities which were created either as having locality, or as being independent of all confinement in the organs, become the regulators of all organic motions. These entities were made responsible for all kinds of diseases, and all remedies were addressed to them, but no one all this time, took the trouble to ascertain the action of these entities on the organs themselves.

* Some careless and very superficial readers, have ignorantly ascribed to Hartley the opinion that nerves were cords, stretched and vibrating like the strings of a harpsichord, although that great man expressly disclaims any such notion.—*Trans.*

Still later, and in times nearer our own, some physicians felt disgust at these abstractions, and thought to work wonders by substituting some new entities to the old. For fear of repeating antient absurdities, they refused to explain how the blood, the bile, the phlegm, the lymph, the nerves, could become the causes of disease; but they admitted a causality which served them instead, by recognizing in some general manner, a sanguineous element, a bilious, a pituitous, and a nervous.

Among their predecessors, some had attributed certain maladies to inflammation—others to some saburra (alimentary undigested concretion) which must be evacuated—others to an excess of force—others to an excess of weakness in the stomach—some to putridity of the humors—many, quite as numerous to malignity, whose cause was ascribed to defect of energy in the vital principle. The new fangled ontologists reconciled all these disputants by creating for the same maladies inflammatory elements, saburral or gastric, which were synonymous; sthenic and asthenic, which were opponents; putrid, malign, irregular or ataxic. Nothing became easier than the diagnosis and the treatment of diseases with the aid of this legion of entities; the doctors always agreed, for they created a genius to preside over each symptom, and the supposed specific remedy, which was in fact no other than the method prescribed by the same ancients whose language was rejected, was admitted in the catalogue of the polypharmacoepia destined to exercise all these hobgoblins.

Thus it was that the consultations of medical juntos were arranged to the great advantage of *Decorum*; for the profane were no longer witnesses of those scandalous disputes whose memory has been preserved by Moliere and other satirists.

How then can we be surprised that the ancient idea of Soranus on the nature of insanity, should have been lost, and that much pains were required to produce evidence concerning it? The elements, the principles, the morbid Genii, acted on the brain; this is all they could say; and when they were compelled to admit the presence of inflammation, this appearance, so found, was admitted only as accidental, just as it was asserted to be in the pretended essential fevers.

Every one knows, that among the theories which I have brought up to recollection, that of nervous energy and vital

energy, has ultimately succeeded more or less. But animism has always had its partizans: we see even at this day there are physicians who assert even in *print*, that madness is an affection of the immaterial principle, and that it has no particular seat; but a far greater number maintain that it depends on morbid elements, without giving any reasonable or satisfactory explanation of the mode of action of these entities.

After the explanations of hypothetical theorists, come those of the followers of anatomical pathology. We may expect now to find something, if not more reasonable, at least more material, and more intelligible to common understandings; we shall soon see if this presumption be well founded.

We have said that physicians have too much confined the idea of inflammation by taking phlegmon as the type of it; no disorder shows this better than insanity. As it is extremely rare to meet with pus like that of a phlegmon in the brain of madmen, nobody thought of inflammation there. On the other hand, as no one discovered the relation of cause and effect between the lesions of which we have spoken in the dead body, and mental alienation, there was great difficulty in materialising this affection. Indeed, with the usual idea of inflammation, how could it be supposed that the hardenings, the softenings, the diminutions and inequalities of bulk of the brain and cerebellum, the density, the opacity, the injection, the adherence of the membranes, the hardness or softness, the thickness or the tenuity, the consistence, with or without the ivory appearance or the friability of the bones of the cranium, could be the causes of so many kinds of delirium, of fury, of convulsions, of prodigious increase of certain talents, and of the total brutality of the intellectual faculties? One might reconcile fury and an increase of muscular force, with the hardening of the cerebral substance, on finding it accompanied by sanguineous injection, for here was evidence of the first degree of inflammation; but to confirm this idea, it would be necessary that all the chronic shades of inflammation, should present traces of suppuration analogous to that of phlegmon as their type. But this was scarcely ever seen; and hence, in our opinion, all notion of cerebral phlegmasia, as the cause of insanity, was abandoned. In all cases, therefore, as it became absolutely necessary to connect the alterations of the brain and

its membranes with insanity, not being able to view them as causes, they were converted into effects.

This explanation, absurd as it is, passed amidst a number of other absurdities, which swarmed in pathology until 1816, when I printed in my *Examen de la doctrine medicale generalement adoptee*, a question which I propounded in my own lectures, ever since 1814. I asked of my honorable brethren what they understood by pathological alterations produced by a disease ; and how they conceived that a disease could act upon the organs, since, according to the most philosophical nosographical definitions, a disease is nothing more than a bundle of symptoms. I applied this question to each disease in particular, and especially to those fevers denominated essential. In 1821, I republished it in my second *Examen*. I endeavored to ascertain what idea one could form of a group of symptoms which tumefied and obstructed, hardened, softened, ulcerated, perforated, and mortified the organs ; and not being able to find in any of their attributes, an agent capable of such actions, I concluded without doubt, that physicians had erected the word by which they meant to designate the disease into an entity, whether material or immaterial, I could not say ; but at least endowed with an activity proper to itself, and independent of that which belonged to the organs. One of my most distinguished pupils very happily exploded this idea in his refutation of a treatise on fevers which was meant to become a classic work. Taking each symptom in particular, Dr. Roche jocosely enquired of the ontological compiler, whether the burning heat, the foulness of the mouth, the thirst, the stupor, the bad breath, the prostration of strength, circumstances into which, according to the nosologists, the entity, *adynamic* or *putrid* fever, ought to resolve itself, possess the property of softening the internal membrane of the stomach, of ulcerating and perforating it, and of producing intro-susception of the intestines.

These pleaders against the essentiality of disease, vigorously sustained, during ten years, by a crowd of intelligent men, educated in the physiological school, have introduced an immense revolution in the medical science of France. But it is with great difficulty indeed, that this revolution has found its way into the establishments, public and private, devoted to the treatment of insanity.

Among the chief of the classic authors now living, who

give the law on the question now before us, some still contend that the alterations of the brain are the effect of the disease, which they define by enumerating the symptoms; others allow that there does sometimes exist inflammation, at first acute, but afterwards chronic, but that this is not always the case; and that there is a lesion of the vital principle anterior to the affection of the tissues; and that this lesion prepares and consummates their disorganization. The first set, seem to have no fears that they shall be asked by what property the mental wandering, the fury, and other symptoms, can harden the brain; nor how stupidity can cause it to be injected, softened, or reduced to a state of atrophy. The second class have not dreamed of the difficulty of exhibiting their vital immaterial, or their nervous entity, in action and disorganizing the brain so as to produce delirium.

It is well known that the greater part of men of science, who have their opinions made up, are not apt to change, especially after they have once published them: we must expect, therefore, that medical doctrines will advance rather by the labors of the pupils than by those of the masters; and so it has happened, but to a certain point only; for the pupils attached to lunatic hospitals have not always been those of the physiological school; many of the truths taught in that school have been applied to insanity, but the most important have been neglected.

In 1820, Professor Lallemand, as yet a student, advanced in print that the inflammation of the arachnoid coat, participated by the pia mater, was a frequent occurrence, and that it was the principal cause of delirium; but he did not apply this observation to insanity. He also said that the inflammation of the cerebral substance could not produce delirium; he considered this rather as the cause of convulsions and partial paralysis; and with me he referred the softening of the brain to inflammation.

Among the young physicians who lived with insane patients, one of them, in 1823, held in opposition to his professor, that mental diseases were the results of various modifications of the meninges and the encephalon: another, in 1825, taught in a publication, entitled "A new doctrine of mental diseases," that not only common delirium, but insanity, consisted usually in a chronic inflammation of the meninges, but he added an irritation either specific or sym-

pathetic of the brain itself, also as a cause. The first of these, developing the idea he had announced, pretended to have taught the medical world that the lesions observed and described by authors, and which we have enumerated a few pages back, were the causes, not the effects of insanity, introducing, as he averred, a new method of considering this disorder. He attributed it sometimes to an original, sometimes to an acquired mal-conformation of the head ; sometimes to a lesion of the meninges, sometimes to a hardening of the brain, sometimes to a general or partial softening of that organ, or as the case might be, to any of the organic alterations I have enumerated, but always insisting that the engorgement of the vessels of the brain and pia mater was the most frequent occurrence, and the most frequent cause also of insanity.

The second of these writers, conceived with many teachers, that insanity might take place as a sympathetic effect of the lesion of some other organ than the brain. The first of these authors, in 1826, declared through a third person, whose opinions coincided with his own, that the gout, diseases of the lungs, and even those of the digestive organs could not be causes of insanity which were always to be sought for in the brain.

Here then are some of the physiological doctrines that stept over the threshold of lunatic hospitals, introduced, not by masters, but by students. Still, these students did not perform all that they might, and all that they ought. They did also what they should not have done, for they boasted of having discovered a new and fruitful principle as applied to the theory and practice of mental disorders, to wit, *that the alteration of the brain and its membranes are the causes, not the effects of this malady*. They omitted what they might have done, for they presented by this assertion, in spite of all the labors of physiologists, a false idea of the manner in which the organs thus affected produced the phenomena of mental alienation. The proofs of these two assertions will become more evident by the exposition I am about to make of what was taught and printed in the physiological school, before the writings of these two young physicians appeared.

In my lectures from 1814 forward, I referred all delirium, whether acute or chronic, to the irritation, original or sympathetic, of the brain ; adding, that this irritation sometimes

did put on the character of inflammation, but sometimes did not reach that point ; such was the general idea. Convulsions, partial and general loss of sensation and motion, engorgements, congestions, softenings, effusions, extravasations of all kinds, whether of the brain or the meninges, were referred by me to the same cause ; and surprise was excited to find that apoplexy and mental alienation, were explained by the same theory as frenzy. Moreover, I persuaded strongly all the pupils to search for facts that should confirm or refute these assertions. It was after he had listened to all these developements that M. Lallemand put forth his "*Letters on the Encephalon*," a work composed in great part of observations extracted from the practice of physicians whom he had followed while a student ; but disposed and commented on in the manner of my "*History of Inflammations*. He advanced the proofs of my assertions on the causes of convulsion and paralysis, and he essayed to describe with precision the symptoms that corresponded with each degree of encephalic lesion of which he took cognizance. It must, however, be remarked, that he never set out from irritation as the starting point in all the maladies he described ; he spake only of inflammation, a thing well known of old, and brought into vogue in England, in reference to these disorders, by Dr. Abercrombie and others. He located, moreover, the cause of delirium in the inflammation of the arachnoid coat.

The year after, 1821, I printed the opinions that I had held for seven years before, on the affections of the encephalon, and which had been already published. They conformed to what I had already published on other maladies. In my *Examen des doctrines médicales*, p. 770, are to be found the opinions here advanced, viz. that sanguineous congestions in the brain, serous and hydro-cephalic congestions, arachnitis, apoplexies called nervous, cerebral cancers, fungous tumors of the dura-mater, acephalo cysts or hydatids, tubercules in the brain, osseous tumors on the internal walls of the cranium, lethargy, epilepsy, and that softening of the brain that Dr. Abercrombie had already regarded as the effect of encephalitis, are all the results of one phenomenon variously diversified, IRRITATION. Let any one point out, if he can, in any post mortem examination (autopsie) of persons who have died insane, and which have been described by any author whose works I have ex-

amined, any organic alteration bearing upon the subject, which is not referable to this cause.

It remained to refer, by name, all these alterations to insanity ; and this was done in the 123 proposition of the "Examen," printed in 1821, and which, with the 467 others that accompany it, is nothing more than an abstract of my course of physiology and pathology during seven years. Here is the text of that proposition : "Madness always supposes an irritation of the brain. This irritation may be continued there for a long time by means of some other inflammation, and may disappear with it ; but if it should be prolonged, it finishes always by being converted into encephalitis parenchymatous or membranous."

This proposition was not a mere glance, hazarded ; it is the substance of extensive discussion to be found in the course of a work on the subject of nosography, a new work on the softening of the encephalon, the two first letters of Professor Lallemand, and finally in oral dissertations repeated during seven years in my course of lectures, theoretical and practical. From these multiplied sources proceeded the general proposition above stated, in which, to avoid absurdities in language, and dangerous contradictions in practice, it is absolutely necessary to adopt irritation as the original phenomenon, and as connecting almost all the cerebral maladies. This proposition had been already announced in 1808, in the "History of Inflammations," (phlegmasiæ.) I re-produced it in 1816, and applied it to the whole of pathology ; finally, in 1821, it again appeared with precision as applied to insanity.

It is easy then to judge, that the authors, of whom we have spoken, have not acted accurately in attributing to themselves the discovery of "*a principle subversive of all the old theories on mania*," for this principle is not a new one. Nor have they acted accurately in boasting that in 1824 they first established the medical diagnostic as consisting in *giving to external phenomena a representative value of the internal state, or of the lesion of the organ which was the seat of the disorder*. This idea is in fact the parent of the physiological doctrine : it is this which dictated the history of inflammations (*Histoire de Phlegmasiæ*) in 1808, the first *Examen* of 1816, and the second of 1821. The complete developement of this same idea has been advanced in theory, and applied in practice to a great hospital, before

numerous witnesses in the midst of the capitol of the nation since 1814 ; that is to say, probably, before these young men had commenced their medical studies.

In attributing insanity to the alterations which take place in the encephalon and its dependencies, these authors have not done all that they might have done : for instance, not being acquainted with the physiological doctrine, they did not feel the necessity of irritation to establish a regular system of pathology : they surreptitiously seized upon the notion that the symptoms ought to represent the state of the organs ; but how, physiologically, this happened, they had no clear idea ; they never doubted whether it was by irritation, and by irritation alone, that one organ acted upon another ; and that this constituted the sympathies. They never suspected that irritation existed in the organ sympathised with, as well as in the organ sympathising ; that it is the phenomenon common both to one and the other ; and that this idea alone can explain how the organ sympathised with, may become altered and disorganised in imitation of that which sympathises.

Ignorance of this fact, which they might have understood had they studied the physiological doctrine, has tempted them to say that insanity sometimes depends on vitious conformation, natural or acquired, of the scull or of the brain, sometimes on a lesion of the meninges, sometimes on the hardness of the brain, sometimes on its softness general or partial, sometimes on other alterations referred to before in this work, but most commonly to the engorgement of the vessels of the brain and pia mater. These assertions want precision, and are embarrassing for readers, because they do not speak to the understanding. How can we attach delirium directly to lesion which is so various ? Moreover, insanity exists a long time before all these alterations are formed ; and the proof is, its intermittent periodicity, and its sudden cure by some strong moral impression in the midst of intellectual derangements the most outrageous, or stupidity the most complete. Insanity is not the effect of these lesions, but of the cause that produces them. But this cause is not necessarily inflammation, as some authors have pronounced it to be. This is also proved by the possibility of sudden cures by moral causes, even after many years of malady ; a change incompatible with real inflammation, which would have produced an alteration in the organs themselves.

Moreover, because they have no proper idea of irritation, certain writers on mania have advanced that insanity could not be sympathetic, or depend on the influence of another affection. The reason they assign is, that the seat of a malady cannot be elsewhere than in the organ whose functions are deranged; language vague, enigmatic, and the source of vain disputes about words.

No doubt (our physiological physicians will say) the seat of mania is always in the brain; but the brain may be irritated by an organ which is still more irritated than the brain itself is; there may be irritation for a long time before there is inflammation, and before there is disorganization; and this may cease when the brain ceases to be irregularly stimulated by the organ which acts upon it. Thus the breaking out of the monthly discharge in females, an hemorrhoidal flux, a vomiting of blood or other liquid, the application of leeches to the epigastrium, &c. &c. may dissipate insanity in the twinkling of an eye, and even forever.

Not to have understood all this—not to have applied the phenomena of irritation to mania—to have left it under an uncertain dependence on lesions which it does not imply—in refusing to explain in what manner these lesions can produce it—not to have explained the therapeutic practice indicated by the most common laws of irritation—in other words, not to have shewn how insanity might be advantageously modified by directing the influence of some organs upon others—to have entertained but two general views: one that of placing the exclusive seat of mania in the brain, without making any attempt to explain sympathetic manias, and being satisfied with denying their existence—all this does not amount to a well studied knowledge of a doctrine whose existence was undoubtedly well known, because the persons alluded to had borrowed from it; a doctrine which comprised all the elements of the problems to be resolved; in a word, it is a culpable omission of doing what might have been done.

An author who ought always to be cited whenever there is any question in discussion concerning the brain, and who by his great labors on the functions of the encephalon, has acquired permanent claims on the gratitude of mankind, Dr. GALL, has not stopped at these superficial views, and indiscriminating explanations: he rejects with disdain the opinion of those who attribute insanity to the alteration of the

bones of the cranium or any other. According to him, "mechanical and organic derangements are subordinate to the changes which take place during life ; they are results only ; and the life of some particular part, or of the body generally, may become extinct without any visible organic derangement. He adds, that when mania has not been of long continuance, we find nothing ; but if it has remained a considerable time, we find in the brain, in the meninges, and in the cranium, manifest alterations ; such as ossified vessels, a diminution of one part or the other of the cerebral substance, osseous depositions on the internal surface of the cranium, &c. the results of some alteration inappreciable by our senses, but which has affected that power on which life and its functions depend."

Dr. Gall was acquainted also with the other alterations before mentioned, and has explained them in the same manner. Inflammation is not the primary cause of these disorders ; it places them only on the same line with shocks that the brain receives, with accidental lesions, or some organic fault in the brain or meninges, some roughness of the internal part of the cranium, an intellectual contention too long continued, a project baffled, hope disappointed, an ambition without bounds, vanity wounded, and other moral causes, which he refers, like all the rest, to a lesion of life. In other places of his writings which have appeared subsequent to the publication of the physiological doctrine in 1816, he remarks that the augmentation of the irritability of the brain is manifest in the antecedent state, and through the first period of insanity. He does not, therefore, imitate those who, by a retrograde movement, have abandoned the explanations of Pinel, who for the sake of ranking among the anatomo-pathologists, consider insanity as nervous in its origin, and agreed with them in acknowledging no characters in disease, but such as were manifest on a post mortem inspection.

Dr. Gall does not explain the atrophy of the brain at the close of a prolonged mania of inflammation ; he attributes it to a *lesion of the vital forces*. A brain which has long been injured in the mode which constitutes insanity, is affected by atrophy just as a sciatic nerve is, which has been long affected by pain. Moreover, the brain cannot sink down and become pressed in all its parts upon itself without being followed by the scull, unless some effusion should take place

between them. Hence the separation of the internal table from the external, which last is less disposed to follow the retreat of the brain. But this is what arrives in the regular atrophy of the brain, the result of old age. But there will be this difference: in an insane person the space occasioned by the separation of the two bony tablets, instead of being occupied by a diploid tissue with large cells, which renders the bone thin in old subjects, it is filled on the contrary by a dense bony substance which penetrates both tablets, and renders the skull very thick, dense, and like ivory. This kind of alteration is so common, that Greding has observed it in 68 out of 100 furious maniacs, and 22 times out of 30 in idiots.

These remarks of Dr. Gall ought to put the writers on mania on the right road to truth. I cannot adopt all the ideas of this scientific observer on the seat of mania; but as it is to him we owe the most valuable data, we must start from thence to go further if possible; at least we must try.

Dr. Gall considers insanity as a disease exclusively located in the brain; and the young writers on the subject have borrowed this idea from him. According to him it is an affection of the *vital force* of the brain. The oftener this occurs, especially at the commencement of the disease, the greater is the increase of irritability, attended with an increased activity of the circulation, and even with inflammation. But this inflammation is not the principal agent in the deterioration of the brain. The author is much more occupied in proving that the seat of insanity is the brain, a fact which no sensible and well informed observer ever doubted, than in determining what the physiological character of this modification of the brain really is. It is the *vital lesion* of the brain which induces the atrophy, the thickening, and all the accessory symptoms that denaturalize it; but we do not well see how to attach this vital lesion to some fundamental, applicable, distinct appearance; for he speaks only of a modification in general, of some unknown principle called life. This is well understood.

Dr. Gall, after placing insanity in the brain, is principally occupied in determining what region of the brain is affected. We know that Dr. Gall considers the brain as a double set of nerves, or pairs of nerves, analagous to those of the external senses, but which do not quit the cranium, and whose

number is yet undetermined. That each of these intercra-nial pairs, is charged with some intellectual tendency or faculty ; they are called organs, and their situation at the periphery of the brain, allows of their being more or less distinguished by means of the osseous bumps or projections of the external scull ; that the instincts, the aptitudes, the different degrees and different kinds of intelligence of each individual, not only of the human, but the brute species, may be thus indicated ; that the vital modification which constitutes insanity, may sometimes take place in all the organs at once ; but that it may also, and generally does predominate, or locate itself, exclusively or successively, in one or other of them ; so that besides general mania, there may be as many monomanias as there are different organs in the brain.

This theory (it is said) enables us to explain, how excessive passions and excessive intellectual efforts, may lead to insanity. It is particularly to the super activity of some tendency to which the person adds energy by indulging it, or by the influence of some predominant faculty which seduces the inclination by the facility with which it is exercised, that man loses his reason. Inflammation often appears in organs too much exercised, a very common symptom in the access of general mania ; or it may be confined to some organ in particular. Hence the possibility of suppuration ; but although possible, it often does not take place, as when we observe on opening the head no trace of lesion. But when the derangements of organization are not produced by inflammation, which happens in the smaller number of cases, there is at least that vital lesion which constitutes insanity."

We may now see in what respect all this is defective. The learned organologist, ought to be able to say, if there be not inflammation and suppuration that disorganizes the brain, it is at least irritation that produces this appearance ; a modification not only possible in all the tissues, and which in this case acts on the cerebral fibre properly so called, but on all the other tissues that constitute the intellectual apparatus ; as the vessels that moisten it, the membranes that envelope it, and even the osseous case that incloses it.

Pinel and his followers have explained themselves as faultily when they could see nothing but a nervous phenomē-

non in insanity ; I prove this by the same argument that I employ against Dr. Gall. What kind of a nervous lesion is that, by means whereof the cerebral vessels become engorged ; which produces effusions, phlegmons, adhesions, thickenings, ossifications ; which can act on the skull so as to produce the consistence of ivory and the hardness of enamel ? Nor have we any clear conception of what the organologist calls vital lesion ; an affection indeterminate, arbitrary, applicable to every supposed action on the organs, whatever may be their difference of texture, consistence, &c. What means have we of representing a neurosis than can produce all these disorganizations, consistently with the idea we have always entertained of nervosity ? Pinel thought he could escape by regarding all these disorders as complications or coincidences ; an illusory subterfuge which would populate insanity, as well as all the other neurosis of the same author, with a crowd of morbid elements, inexplicable, casual, of which we know not either the diagnosis, or the treatment.

Without adopting throughout the organology of Dr. Gall, we are compelled to agree with him and all the other well informed physicians who have preceded him, that insanity is seated in the brain. But we must analyse this expression, *it is seated* in the brain, for it has been strangely abused : it throws obstacles in the way of knowledge, and dictates every day to more physicians than one, assertions that experience disavows. What is it among maniacs that is seated in the brain ? Is it delirium ? No doubt a man will not rave but in consequence of some malady of the brain. Let us, however, come to the second question. Why does the brain experience this aberration ? I would answer, because its irritability is augmented, or because its contractility is beyond its normal degree ; because it is over-irritated, or simply irritated, that I may keep to that sense of the expression which is adopted in the first part of this work.

A third question now arises, which observation and the practice of the art ought to dictate to all physicians. Why should the brain be irritated ? Or in the other words, is the cause of the irritation of the brain seated in that organ, or in some other ? The physician who decides on the first and obvious view of the facts, replies, that the cause may reside solely in the brain, but that it may also be seated in some other organ : he judges by those insanities that take

place after the affection of some other organ, and which are cured so soon as that affection is dissipated. But Dr. Gall and his partizans who are at present very numerous, judge differently. Since delirium cannot exist without an affection of the brain, the cause must be located there. But they elude the question, and they must be brought up to it. Let us address them then. "We do not ask you whether the brain is affected whenever there is delirium; this would be a question as silly as if we were to ask whether the muscles are affected in a convulsion; but we ask of you whether the affection of the brain, may not be so subordinate to that of another organ, that it may be produced by this last, and cease when it ceases. You deny this fact, assuring us that in every case of this nature which you have observed, the brain has been originally affected; and you accuse us of having seen incorrectly, when we attribute the affection of the brain to that of any other organ. This is bringing us at once upon the field of observation. Very well; we repeat then, that we have seen cases of insanity produced and sustained by another disease; in other words, the brain has not been deranged in its action until another organ has been so before it; and it has been re-established so soon as that other organ re-assumed its healthy state. We shall now explain this dependance of the brain, which appears to you so incomprehensible; we shall do so after having taken precautions against indiscriminate expressions, insinuations, and the snares of language. In fact, the word *affection*, is indiscriminate; the word *malady*, is somewhat less so; but still, too vague to paint the phenomenon which we are desirous of studying. *Affection or malady, which causes delirium*, is a mode of speaking which induces us to ask the following questions: Affection or malady, in what does it consist? *Insanity* gives us no precise idea, unless in a moral respect; that is to say, in connection with mankind; but the question now is, concerning the pathological physiology of the individual. A logician would not understand us if we asked him whether delirium was seated in the brain; for, what is a *delirium seated*, to a man accustomed to give some account of the meaning of words?

Vital lesion, sounds also very physiologically; but this mode of speaking has too much the air of an evasion to satisfy a demandant somewhat scrupulous; for a man who reasons will not be able to comprehend what is meant by a lesion of

life which precedes, and which causes that of the organs.* The expressions, *affection of the nerves*, *nervous affections*, seem more to answer the purpose, because they present a material object modified ; but we know not by whom or how it is modified ; nevertheless we cannot, without being satisfied on this point, represent to ourselves a nervousity capable of producing all those disorders, of which the heads of insane people present such an astonishing spectacle.

* All that has been urged before in this book, concerning the abstract principle which certain writers have been desirous of imposing on the nervous system to produce the phenomena of intelligence, applies to *vital force*, as well as to all the particular forces into which they have attempted to resolve it. These forces do not fall under the cognizance of our senses ; they are conclusions from phenomena, and every one multiplies them at his pleasure. Thence proceed all those forces of contraction which subdivide themselves into as many species as there are degrees of contractility, and forms of animal matter endowed with it : thence come the forces of composition, decomposition, plasticity, vital resistance, condensation, expansion, calorification, &c. according to the greater or less disposition of physiologists to decompose the sensible phenomena ; hence also the disputes upon the number of vital properties.

Does a question arise concerning life in general ? Some make it the result of particular lives : others admit an original vital force that produces it, and among others, this life is divided into two—one for nutrition and re-production—the other for intellect.

There would be no inconvenience in all this, if after having assumed, or supposed these vital forces, they would limit themselves to describe the phenomena from whence they have been deduced ; they would then be no more than algebraic signs, to facilitate the labor of research by abridging the forms of enunciation. But it is not in this way that the ontologists proceed : real idolators, they prostrate themselves before the symbolical image that they have constructed of so many pieces ; and they set it to work as if it were a power *sui generis*. As they have no other idea excepting those which proceed from their senses—as they have no models superior to themselves—they always lend all their faculties and all their intentions to the force which they have thus brought into existence, and which they cause to act as they act themselves, or as they have seen others act, for whom they profess admiration and respect. In fact, all the forces of the physicians of Montpelier, are little divinities thus constructed, and the great vital force is an intelligence of the first order, whose model is taken from all that they have seen most grand and extraordinary among men. This is a continuation of the polytheism of the Greeks : these are the Fauns, the Satyrs, the Naiads, &c. whom they have invested, each with its functionary apparatus, and the other is the great Jupiter, whom they have seated upon his throne in the encephalon, to preside over all the phenomena of relation. Such are the motives which compel us to reject the words *vital force*, *vital lesion*, from the strict language of physiological medicine ; or else to employ them only as formulæ, giving their precise meaning when we employ them.

CHAPTER VII.—THEORY OF INSANITY ACCORDING TO THE PHYSIOLOGICAL DOCTRINE.

If we ascend now, to the principles of the physiological doctrine, as herein before exposed, we shall find something more satisfactory. It is said in a former part of this work, that living animal matter, being modified by certain agents, is capable of exhibiting in a surprising degree, the phenomena characteristic of life ; and this is called *irritation*. Nothing is more clear ; it is said, moreover, that there are four principal forms of irritation, if we may judge from appearances obvious to the senses, viz: *the inflammatory, the hemorrhagic, the sub-inflammatory, and the nervous* ; and an idea has been given of these phenomena, and of the organic alterations which correspond to each of these forms, by noting that the nervous is the principal form which gives impulse to all the rest. All this is easily conceived, because it appertains to the modification of living matter, cognizable by our senses. Let us see then, if we cannot apply these data to Insanity. Let us then give an abridged history of it, in physiological language, for the purpose of trying if we can be understood, and if we can resolve the question concerning the seat, or the seats of this malady.

Let me now recall one of the fundamental truths of physiological medicine, upon which I have already greatly insisted ; *that the brain is placed between two orders of stimulation, those which proceed from the nerves of the external senses, and those which it receives from the nerves of the internal viscera*. This being stated, the generation of insanity explains itself, by referring the intellectual faculties to the physiological theory.

The excitants which have been carefully indicated in the first chapter, having acted with too great energy, and during too long a time, on the principal organs, which are all abundantly supplied with nervous matter, the brain, which is the centre of this matter, assumes a state of irritation ; innervation becomes excessive, which appears by an augmentation of sensation and motion ; for it is impossible that the manifestation of a nervous irritation should appear in any other manner, unless from the very commencement ; irritation should be carried so far, as to destroy all the phenomena of innervation. There is then an excess of susceptibility on the part of the brain, toward all the stimu-

lations that are natural to it, and primarily to those of the senses. Moreover, there is an excess of motion in the circulation, and in the action of all the muscles, upon which the brain innervates, and by which it shows its irritation. This portends that the increase, if not of the frequency, at least of the vivacity of the pulsations of the heart, the play of the countenance, the unaccustomed mobility of gesture, and the hurried speech, coincide with an exaggerated moral susceptibility, in manifesting the approaching danger, or the first actual access of insanity. But these manifestations may be made in other ways which we ought to be aware of; they may depend on the place originally irritated, and on the degree of irritation, which is itself subordinate to distant causes, to their prolonged action, to the susceptibility of the subjects, &c.

In fact, sometimes the original exciting cause depends on the moral relations between man and man; or on the sensitive or instinctive relations of man with animals, with inanimate bodies, or even with the accidents of nature; the cause then is nervous; that is to say, it commences by an excitation of the nerves; at other times, the original exciting cause depends on the relation of the internal part of our viscera with the foreign bodies that arrive there; such as stimulating aliments and beverage, medicines and poisons; and in this second division of etiology, many shades of irritation are possible. It may be that the exciting cause is calculated to produce an irritation in the stomach, rather nervous than inflammatory, such as alcoholic liquors, and certain diffusible aromata: then the irritation propagated to the brain, is also principally nervous, and more or less approaching that which depends upon certain moral causes: we say, rather nervous than inflammatory, because, for a reason already given, there is no nervous excitation which does not affect the capillary blood vessels. It is equally possible that the exciting cause may give rise to an irritation in the stomach more inflammatory than nervous: in all these cases, there is almost always a painful sensation in the brain, which receives the transmission of this double gastric irritation. The over-susceptibility of the encephalon will then be accompanied by ill humor, low spirits, fear, anger; and the threatening, or the actual manifestation of insanity will be marked by melancholy characters, or by an inclination to commit some act of violence on himself and on others.

Let us now mark the possible combinations of these two orders of causes. Let us suppose that the moral causes act upon a brain, which has already received impressions from a disordered viscus ; we shall then have a double cause of insanity, melancholy or furious ; and the habitual ideas, the opinions, or the belief of the patients will determine the kind of delirium. Let the physical causes be directed upon viscera, which, although healthy themselves, are in correspondence with a brain, affected by sombre ideas. In this case the delirium will necessarily be less melancholy ; let moral causes of a gay description, such as joy, satisfied self love, pride triumphant, act upon a brain more or less stimulated voluptuously by some organ adapted so to modify it, as the reproductive apparatus, and the result will be a joyous delirium. Let us now suppose differently, and combine in a thousand different ways, all these stimulations ; let us add to them, those that are already established in the intracranial nervous apparatus, dedicated to instinct and to intelligence ; an apparatus of great importance, as it constitutes the hemispheres of the brain and the cerebellum ; let us now figure to ourselves, the nerves, as having been long busied upon recollections ; that is to say, in modes and manners, that have already previously existed, and this also implies the over action of some nerves at the expense of others ; let us combine these recollections differently by another mode of action, called *imagination*, which is perhaps, nothing more than the predominant action of certain nerves of the same apparatus ; let us associate these recollections, already denaturalized, with the actual impressions of the senses ; let us conceive that the result of this internal action is a permanent irritation of the organs of thought, and that this irritation is augmented by all those which are accidentally developed in the viscera ; then let us join to all these the infinite variety arising from individual irritability and peculiarity of education, and we shall at length comprehend why there appear so many shades and so many forms of maniacal delirium. Nevertheless, we shall not after all have discovered the first cause, seeing that this cause is the same with the cause of thought.

Some one, perhaps, will require us in this method of etiology, to present other facts than those which have been enumerated ; and whose verification, in other respects easy, requires the knowledge of a multitude of other diseases, and

the mode of action of many modifiers, medicinal or hygienic. We can do this, by referring to some very common facts.

When we are intensely and vividly occupied, either with some person, or some thing, we retain the image of it ; we see it, we hear it, as plainly after it has been taken away from our senses, as if it were still in immediate connection with them. A man who interrupts a business that he was intently occupied upon, for the purpose of taking rest, continues to think of it, instead of sleeping ; and for the most part, even sleep cannot interrupt the train of ideas, which is prolonged in dreams. But while the man does not deviate from his normal state, distraction of thought, repose, sleep, produce a cessation of all these predominant impressions ; that is to say, they make him unmindful of his pain, they calm his resentments, and at length re-establish an equilibrium, and replace him in an aptitude to receive new impressions, and to react upon them with propriety. But if the predominant impressions have acquired a very high degree of strength, whether by the unaccustomed activity or the long continuance of their causes, or by reason of some predisposition in the person, these impressions are not effaced ; there is an exaggerated and troublesome recollection of them ; the man cannot abstract himself from them ; and whether he indulges in them pleasantly, as in the case of erotic melancholy, or whether he detests them, as in other forms of melancholy, he soon discovers that these recollections draw others with them, which he had no motive voluntarily to recal. The patient (for from henceforward he must be so considered) suffers that interior movement, that tyrannic recollection, that forces him to contemplate a crowd of images that he would gladly drive away ; his inquietude increases when he perceives, forming within himself, monstrous combinations of these images ; a kind of intellectual burthen which has been referred to a faulty imagination, while all the reason he can employ, hardly suffices to prevent his believing in the reality of these chimeras.

Well, this exuberant activity of the memory, these extravagant combinations of the imagination, amount, with the physiologist, to nothing more than a too lively, and too pertinacious action ; to an irritation of the nervous substance of the brain, destined to intellectual operations.

But the impressions transmitted by the senses of sight, hearing, and touch, the stimulations indicative of some bodily

object, and which so powerfully serve to enrich our intellect, do not constitute all that can be reproduced as the phenomena of memory ; there is also, notwithstanding the absence of any immediate cause, a recollection of sensations, pleasant and unpleasant, which have been excited afore-time, by the modification of the nerves of the locomotive apparatus. The patient not only thinks that he feels an amputated limb, but he still feels lively pains, of which he can specify the seat ; a phenomenon of memory, which can only be explained by some excitement of the brain, renewed in the absence of its original cause ; a phenomenon decisive of the question, whether perceptions and ideas are any thing else than stimulations of the cerebral substance.

We shall now have to determine, whether the nerves of the viscera can give rise to perceptions which the memory is able to recal. Let us first see, what is the influence of these nerves on the brain. The ontologists obstinately refuse to rank them among intellectual phenomena ; but we shall be able to convince them of their error.

Do not the viscera possess a cerebral nerve, the eighth pair, which continually transmits the visceral stimulations to the brain ? Do they not also correspond with the brain, by the communications of the great sympathetic, with the vertebral nerves ? Is it not by this double communication that those relations take place between the brain and the viscera, which constitute instinct ? Is it not thus, also, that the muscular movements take place, necessary for instinctive actions, of which the principal are, breathing, vomiting, expulsion of the fœtus, &c. To be sure, no one will suppose that the wants of vomiting, of coughing, of exonerating the intestines, have their *original* seat in the brain. It must be admitted, that the nerves transmit to the encephalon the cause of its perceiving those wants that are instinctive. But this cause is a stimulation, for it is nothing more than the transmission of a visceral excitement occasioned by the presence of the body to be expelled ; and whenever many of these stimulations are transmitted to the encephalon, whatever may be the cause that stimulated the viscera from whence they proceed, the intellectual operations are greatly influenced, and often are actually prevented by them. Experience shows us also that the *Will* resists them more feebly than it does actual pain, however violent, that proceeds from the nerves, or from the muscles. The

will can prevent a man of courage, even when under torture, from uttering any exclamation, any cry, any groan ; but it cannot restrain the action of the muscles which assist in cries and groans, when the want of coughing, of sneezing, the pains of labor, call upon the encephalon for its co-operation, by means of that influence which is peculiar to visceral stimulations. We have seen the reason of this before ; it is because the mode of action of the brain, which we term *the will*, is destroyed by excess of excitation.

As the brain cannot protect itself from the stimulations every moment sent up from the viscera during a regular state of the system—as the brain receives laws of action from the viscera—as its intellectual operations are often deranged by visceral transmissions, and violently so in all cases of voluntariness—it is not surprising that an inflammation of the digestive or the genital organs should produce an abnormal state of the brain, and provoke a series of ideas different from those that took place previous to the inflammation. Nor is it necessary that the cerebral irritation should be exalted into actual inflammation to denaturalize the trains of ideas ; the effect of stimulating food and alcoholic liquors, the sperm accumulated in the vesicles and spermatic tubes, furnish proof of this. For still stronger reason, the character of our ideas will alter when the digestive and genital viscera habitually over-irritated, incessantly torment the encephalon by transmitting to its nervous fibres part of that irritation which preys upon them. I instance these two sets of apparatus only, because, being the most nervous, they act the most powerfully on the organs of thought ; but I might have brought others also into view, for the higher degrees of irritation in all the viscera act upon the brain. The subjects of these modifications are not ignorant of this ; they feel a visceral sensation travelling toward the brain ; they feel its influence on their intellect, turning aside their attention from the object on which they would willingly fix it, and forcing it upon other sensations and ideas. The hypochondriac, from gastric irritation, feels a sensation of uneasiness proceeding from his stomach, which compels him to ascribe a high degree of importance to all his sensations, as so many sources of unheard of misery, multiplied and irrepressible : the neuropathic from cardiac irritation, is astonished to feel himself overwhelmed with terror the instant his palpitations come on ; or else he feels some spasm

seize upon his heart and render it immovable : the hysterical female cannot repress the sense of suffocation which seizes her, when the globus hystericus moves in her bowels, and threatens to mount up to the throat ; the hydrophobic patient cannot conquer his horror of water, nor repel the melancholy presages or the frightful images which deprive him of sleep or follow him into his dreams, until excess of irritation, deprives him of all power of thought, and hurries him out of life in convulsions. The more irritation there is in the stomach and the pharynx, the more his brain is stimulated, until a congestion takes place which abolishes all intellect. The compliment of all these proofs from facts so various, is found in the effect of sedatives such as leeches, which, acting on the organ originally irritated, and not on the brain, often dispel at once all those symptoms which mark a secondary irritation of the encephalon.

The mode of action then of any diseased viscus on the brain, is in all cases reduced to a stimulation. Well, these stimulations, when they become excessive, continued, importunate, may establish in the encephalon a permanent mode of irritation which constitutes real insanity, and from the moment when the encephalic irritation becomes stronger than the visceral, the scene changes ; for the irritation of that organ may give predominance to ideas, which for a long time the intellect did not entertain. But nothing appears to us to prove that the excess of recollection of visceral sensations is possible : it is this circumstance that enables us to confirm the assertions of the patients, and to prove the direct influence of the viscera on the brain. In fact we produce delirium by placing a stimulant on a membrane of relation ; we cause it to cease, as well as the imaginary terrors that accompany it, when we take away the irritation which that stimulant has produced in the membrane : what more is wanting ?

It may be alledged against this visceral influence, that melancholy never becomes established, unless in the case of an irresolute, pusillanimous character. This cause will not answer the purpose, for the subject has not always been neuropathic or visionary, and he may cease to be so : this constitutes a pre-disposition only ; but there may be insanity of the imagination in persons of good health. Here then are two orders of stimulation established fixedly in the brain, or there is continuous cerebral stimulation perpetu-

ally heightened by those which are transmitted from irritated viscera. All these external symptoms of double irritation exist in the imminent state, and in the first access of insanity ; we have stated them in their proper places.

Instinct becomes depraved even when insanity is in its origin intellectual, because the brain innervates too strongly on the viscera, and receives in return reactions of more than usual strength, and appeals more energetic than in a moral state. It becomes altered first in its highest operation in those productive of intellectual phenomena, afterwards in the affections. An insane person hates those whom he formerly loved ; afterward the alteration affects the wants of the first necessity, as we have seen in the classification of monomania. *A fortiori*, instinct ought to become denaturalized, when the cerebral irritation that constitutes insanity has been fomented and determined by visceral irritation. These cases occur when the disease begins by depraved appetite, as we see in hypochondriac and chloritic cases, wherein the digestive passages are alike affected by irritation. Depravation may also exist in many other instinctive appetites than those which belong to nutrition, as we have stated before in our classification of monomanias ; but I insist at present on the irritation of the gastric passages, because the painful perceptions that proceed from thence, have a stronger tendency than others to melancholy, to fear, to anger, to unhappy forebodings, &c. Hence, in the great majority of monomaniacs who are suicidal and murderous, the disorder has commenced by chronic gastro-duodenitis. All authors refer to these symptoms, even those who are the strongest advocates for cerebral origin ; even they partake with the antients the opinion that to effect a cure it is necessary to evacuate, if not the black bile, at least the viscous and blackish humors with which the stomach and intestines are loaded ; as if they would give us to understand that delirium depends on their presence ; a fact which the cerebrists are not fully persuaded of, because they consider the primitive cause of all insanity to be an alteration in the vitality of the encephalon.

I will not enquire of the cerebrist, whether he attributes the formation of this humor to the influence of a diseased brain, nor what he thinks of the mucous membrane of the digestive organs, of the liver, or of the pancreas, which are sources of these humors. I pass on and say that we must

here note a very important distinction. There are wicked men who, by the effect of their education, (taking the word in an extended sense) are inclined to murder, or are in the habit of committing crime ; such persons do not stand in need of a strong visceral impulse to commit it. What I have said, therefore, applies to worthy men whom insanity incites to murder or to suicide. As to the rest, I am of opinion that when that inclination is once established by a visceral cause, it may sometimes remain, even though its original cause be taken away ; as we see in some madmen who retain this inclination long, conceal it with care, and make use of all kinds of stratagem to gratify it. But we must not forget, that what constitutes insanity is the persevering continuance of cerebral irritation, notwithstanding all the causes that produced it have ceased to act. While the cause exists there is passion only ; the cerebral irritation must become permanent before we can pronounce the man insane.

It is often asked, if a man who reasons well in other respects, but is tormented by an impulse to commit murder, or suicide, which he thinks on with horror, ought to be considered as insane ? I do not hesitate to answer in the affirmative ; for reason does not solely consist in drawing a fair deduction ; it is not given to us solely for the purpose of doing good ; one of its functions is to prevent us from doing evil. But he who gives himself up to an impulse which he condemns, has reasoned very incorrectly, for he has not been prevented by a foresight of the consequences ; he has reasoned ill as to his relations to other persons, or he has not reasoned upon them at all, which is the same thing : he is in like case with one who is excited by wine, who appears to reason justly, but who strikes and breaks every thing within his reach, for the pleasure of destroying. These people have not reason, for they cannot resist the impulse of an instinct depraved by irritation in the polysplanchnic nervous apparatus. This monomania has been called reasoning, to distinguish it from some others, and because the aberration is rather in the actions than in the discourse. But it is always the effect of some secret thought, which the pretended reason of the diseased person has not been able to prevent breaking out into action : this denotes either the absence or the depravation of that faculty ; that is to say, it denotes the loss of that normal type of cerebral action, which presides over the conduct of a man. Here the great ques-

tion of medical jurisprudence consists in knowing whether the tendency to murder is really an effect of a morbid deprivation of instinct ; and the physician will always find it hard to pre-determine, if the person has exhibited no other proofs of derangement, or if he has not furnished such proofs by a violent access of delirium immediately after committing the murder.

The progress of intellectual irritation tending to insanity, is arrested in its state of incubation (primary gradual development) by the habitude of old ideas, or to speak physiologically by the habitual nervous motions of the normal state ; but at length the new mode of stimulation gets the better of the older one ; another habitude introduces itself in the intra-cerebral innervation. While it is not yet general, and has not yet destroyed the ancient habit, the disease is monomania only, or mania with lucid intervals. This is also the case with those insane persons who demand to be tied, or who advise you to keep at a distance from them, when they feel the impulse of committing murder. When the mode of action of the normal state has been destroyed by irritation, the patient can no longer judge of his own situation. This change can only take place from the excessive rapidity of the motions of the over-irritated cerebral nerves ; for we have it in proof that there has been irritation, and irritation implies an accelerated motion in the living fibres, whatever be the modification of animal matter that composes them. Irritation in the fibrine of the muscles, as in the gelatin of the vessels, has for its predominant character a hurried precipitated movement of contractility. Thus, too, it ought to be with the albumen of the white medullary substance, which is the essentially nervous part of the brain : it vibrates with precipitation in this case, in accordance with the gelatin and the fibrin of the cerebral capillary system, as we have shewn in the former part of this work ; and whenever these motions are excessively and preservingly accelerated, the normal type is destroyed, and insanity is fixed upon the brain. The hyper-normal motions which constitute insanity, having become a powerful habit, *le moi*, personal consciousness, can no longer distinguish it from a normal state while the irritation continues. The unanswerable proof of this assertion, is, that you may cure insanity while it is recent and after a short incubation, by destroying nervous irritation of the brain by copious and

reiterated bleedings. This cure is of the same kind as in the case of an incipient peripneumony, for their cause is the same, irritation ; that is to say, that in the two cases, bleeding suffices to cure the disease so long as it suffices to destroy irritation. For, let us be honest ; what else is it that destroys irritation in a man who cannot breathe as usual, and in one who cannot reason as usual, but a sanguineous engorgement in the lungs of the one, and in the brain of the other ? The irritation that produced this engorgement was kept up by it ; and ceased when the engorgement was taken away ; and the usual functions of these two organs were re-established at that moment : this would not have happened if the irritation had been prolonged ; for then a considerable time would have been required to permit the irritation to wear away gradually, or to remove it by revulsive applications. These facts are applicable to all the organs. When experimenters have succeeded in producing a permanent over-excitement in the intracerebral nervous substance of monkeys or dogs, they may produce insanities in abundance.

Insanity may be considered as complete when the impressions made on the senses, as the conversations for instance addressed to patients, are unable to bring back *le moi*, their personal consciousness, from its delusion. This is the touch-stone : for it ascertains that the hyper-normal type of intracerebral movement is too rapid to be suspended. Observe its progress : at first it is momentaneous only—then it becomes prolonged—then it has a tendency to become constant, but the remains of the normal type are still sufficient to suspend it ; but when these remains are obliterated—in other words, when the returns of the normal state which were sufficient to dissipate the torrent of extravagant ideas, are no longer possible, the voice of a stranger may sometimes produce for a moment the same effect ; when this also fails, the type of insanity becomes triumphant and complete.

Why should we be surprised at so many forms of delirium ? All our instinctive impulses and all our ideas being associated with motions of the nervous matter, as effects are with their causes, may be reproduced by irritation existing in that matter. This is one of the great maxims of physiological medicine. I have demonstrated in my *Physiology applied to Pathology*, and in the first part of this work, a truth which it would be well to repeat here, by giving to it, if possible, a more demonstrative shape.

This truth is, that there is a reciprocity of influence between many passions, and the visceral irritations excited by them. For instance, in the same way that fear and surprise cause palpitations of the heart, the same kind of palpitations excited by some physical cause, produce the sensations of fear and surprise. So it is with the stomach : all the moral affections of a sad and sorrowful character, accompanied with an inclination towards anger, affect the stomach ; and when the stomach suffers from any physical cause, sadness and impatience are the consequences. But there is no organ where this mutuality of influence is more manifest than in the organs of generation. You cannot explain the flavor of metal, of sugar, of pepper, of earth, the sound of clocks, or that of one metal striking against another, or the noise of a drum, that enter among the fancies of hypochondriac persons subject to gastritis, unless by a recurrence of some former encephalic stimulation. These are examples of the memory of past sensations rendered more vivid in insanity, as perceptions and ideas likewise are ; nor are they any thing else than an irritation of the organ. These facts furnish proofs also of that association which takes place by intellectual exercise, by the continual tendency to express our internal emotions, between those emotions and the ideas we derive from our senses.* These aberrations of taste, of smell, of hearing, never occur in the first, and are rare in the second stage of infancy ; they do not appear till after puberty, when the brain has received its full developement.† The longer a man has lived, and the more he has exercised his faculties of feeling, and of consciousness of feeling, the more do these illusions become easy and frequent in cases of prolonged irritation of the nervous substance of the organs of relation and the encephalic apparatus. Stimulated by an inflamed stomach, the brain vibrates sometimes in the mode corresponding to one sensation, sometimes to another. All this may be verified by the alternate exhibition of irritants and sedatives introduced into that viscus.

It is by virtue of this association of ideas, and of the images of bodies with certain motions in the brain, that the

* All these cases of association, have been fully explained by Hartley in his 1st volume On Man.—*Trans.*

† I doubt if the brain has received its full developement, till the age of from 25 to 30. In fact there is cause to believe that every portion of the brain, like a muscle, increases in size by exercise.—*Trans.*

violent attacks of the commencement, and the exasperations of insanity, in a word what is called the access of agitation in maniacs, present a rapid succession of incoherent ideas and hallucinations so strange. These phenomena indicate that the pairs of intercranial nerves forming the hemispheres of the brain and cerebellum, are agitated by motions irritative, rapid, and diversified. In effect each mode of innervation reproducing the idea of the body with which that mode was associated, with the emotions it was accustomed to produce, and all with tints incomparably more vivid and characterized, and with a rapidity far beyond the normal degree, we may easily conceive that the words and actions will present a surprising variety, and with great precipitation, like what we observe in anger, in slight intoxication, and in all the violent passions, which are essentially the same thing as insanity, and differ only in their type by a less duration. *Ira furor brevis est.*

It is a constant occurrence, however, in this disorder, that whenever the irritation is vivid without being painful, with augmented innervation on the muscles without convulsion, but rather with an augmentation of their contractile force, the maniacs have a feeling of superiority, a pride and arrogance insupportable, and often a disposition to violence. The greatest part of such madmen break and destroy whatever comes within their reach ; they would kill, if they could, men and animals, and often from no other motive than the instinctive want of muscular exercise, the necessity of expending superabundant vitality, as well as self-love and self-satisfaction, no doubt misplaced in this case ; but we have already shewn that this internal feeling is susceptible of astonishing aberrations. They are in much the same situation as young men just entering upon puberty, when they feel their limbs endowed with a vigor before unfelt ; but in madmen this exaltation of vital power is far more characterised.

We have seen, that when maniacs are afflicted with gastric, visceral, and cerebral ailments, their intellectual operations are directed toward melancholy subjects, and their education determines the ideas that occupy their attention : this constitutes a first period of agitation, wherein the patients are besieged by the most terrifying images, and delivered up to the most frightful despair. What furious animals, monsters, robbers, executioners, police officers, or even the

devil pursues them ; hell appears at the side of them, and they even imagine themselves precipitated into it, and they imitate the contortions under which the damned are represented in books and pictures ; these differences are of no account, it is one and the same phenomenon. The demonomanic is in the case of a person asleep, where *le moi*, (his consciousness of personal identity,) deprived of the aid of reason, that is, of the degree of regular normal excitement, combines different ideas with a slight pectoral oppression, and thinks he sees his breast occupied by a great black cat, by a demon who strives to suffocate him, or by some building that has fallen on and crushed him : he awakes, and the painful sensation becomes reduced to nothing. It is thus with the sorrowful maniac ; on some slight uneasiness he builds a croud of chimeras, more or less lugubrious, to which his brain becomes habituated, and they remain, although in a less degree, notwithstanding the disappearance of their cause. We see here the association of emotions by means of visceral irritation with ideas furnished by the senses ; ideas which a recollection unnaturally vivid renders more intense, and more adapted to react on the emotions which have called them up. Hence, result those monstrosities by which the imaginations of insane persons are besieged, and the excess of anger, of fear, and of despair, that renders them so unhappy.

We should be very wrong to deduce the belief, and the settled opinions of a man from the series of ideas which predominates in him during insanity. That insanity which has not yet reached dementia (or a total loss of reason) is characterised as much by the exaltation of the memory of abstract ideas, as by any other alteration intellectual or defective. The most ancient recollections are reproduced ; and considering the varieties of cerebral irritability, they may become more apparently present, more influential over the actual discourse, emotions, appetites, and desires, than more recent impressions. It is possible, therefore, that opinions renounced may be recalled ; that by an inverse movement the more recent may become predominant, or that a mingling of the one with the other may take place. Hence it is that physicians, placed over lunatic establishments, have so often observed, the devotee become impious, the irreligious man a bigot, the avaricious man a prodigal, the pyrrhonist a sectarian and fanatic, &c. Hence, also, it

is, that the passion, whose excess paved the way to insanity, is not always prolonged during the whole course of this malady; and that we frequently see childishness and oddity, forming the most ridiculous contradictions in the series of ideas of the greatest number of monomaniacs.

General mania, as we have seen, may be either with or without agitation, either furious or not so, and with or without increase of muscular force; that is to say, it has different degrees of intensity, from that which approaches frenzy, and which is accompanied by local sanguinary turgescence, and feverish circulation, to that which seems to be exclusively nervous. The first form of this affection cannot be of long duration, for inflammation disorganizes the brain in a short time, if not overcome naturally or artificially. The second may remain several years, like all irritations of the nervous substance where the blood is not attracted in too great abundance, such as neuralgias, chronic and nervous sciaticas, dependent on an irritation of the sciatic nerve, lumbagos connected with that bundle of nerves called the *horse's tail*, &c. &c.; but the most usual cases are where partial mania, or monomania, succeed general mania, which they had formerly preceded.

There are many ways of explaining monomania. That of *Dr. Gall* is the easiest and the most plausible. If the brain be composed of different organs, it is easy to admit on applying the doctrine of irritation that each organ may be separately irritated; which will give us as many monomaniacs as there are organs constituting the brain: It is to be regretted that serious objections may be made against an explanation so convenient. The first is, the difficulty of circumscribing our tendencies and our faculties, and of referring them to a number sufficiently small of principal ones, so as not to exceed the organs of which, according to *Dr. Gall*, the encephalon is composed. In fact, what are twenty-eight or thirty organs in comparison of the numerous inclinations and preferences of our instinct, and the aptitudes and varieties of our intellect? If we confine ourselves to the small number of organs pointed out by the organologist, we shall be compelled into perpetual subtleties to explain by the different degrees of developement, and the different combinations of the organs agreed on, those tendencies and intellectual faculties which have no appropriate organ. How can we manage this without falling every moment into some

hypothesis, for it is impossible to circumscribe exactly the admitted organs, and to exhibit any central one which communicates with all the others and rules over them when occasion requires? If Dr. Gall could only show, by dissection, a determinate number of pairs of nerves in the brain, and the cerebellum, we might make the attempt to distribute among them all our intellectual capacities, and all our predominances of affection. But he is far, as yet, from this degree of anatomical precision; he confines himself to pointing out to us as peculiar organs, some circumvolutions which make part of a nervous expansion, where nature has traced no division. It is to this nervous membrane that he confides all the treasures of intellect, and what is more, all the instinctive phenomena, one excepted, which he reserves for another expansion, forming nearly one seventh part of the first. It must be granted that such a division cannot satisfy an anatomist, to whom it will appear somewhat arbitrary.

We have on our side, says Dr. Gall, observation. But what are the facts to which he applies it? To certain bony eminences, which may not always correspond with the same bundle of nervous fibres, and which do not always correspond to the predominances of intellect, or the affections. He applies observation thus to the facts in which the brain is concerned: as to the cerebellum, he appeals to a co-incidence which I have not always found exact, and which is probably not the only case of the kind. In fact, in dissections of living animals, there is found great connection between the cerebellum and the muscular apparatus: the reader may consult what we have said p. 75. Moreover, besides the erection which is sometimes wanting in inflammations of the cerebellum, there are always in this case convulsions in the muscles of the spine. Finally, effusions of blood in the cerebellum produce apoplexy as well as those in the brain. The experience of Dr. Gall, therefore, is not exact at all points, nor free from liability to contradiction, even among those who have studied his system with the greatest attention.

An explanation of the shades of intellect and affection (feelings) by the different modes of action, or of irritability of the cerebral apparatus, which is the general organ of instinct and of intelligence, solves many of the difficulties which the bony protuberances of the skull are inadequate to account for. First, we are compelled to admit this mode of

explanation in cases such as the following. Dr. Gall himself instances persons in whom *irritation* has developed faculties which previously they did not profess. But this explains itself much better by an increased degree of activity in an organ common to many faculties and subordinate to one principle of action, than by the increase of vital energy in a special organ which till then was less in size and energy than all the others ; for we cannot see why this *irritation* which may take place elsewhere than in the brain, should not preserve the preponderance of the other organs, by exciting them as strongly as that organ which they were accustomed to retain in a state of inferiority. Nor are these cases uncommon. We find a multitude of instances, wherein drunkenness developes inclinations opposite in character to those of a sober and normal state : so, gastritis denaturalizes the character to such a degree as to convert brave men into cowards, and to make patient and quiet men impatient and captious. In general, diseases that quicken the circulation without producing pain and uneasiness, have a tendency to inspire gaiety, to exalt the intellectual faculties, and produce the illusions of hope ; while those which depress the circulation, which confine the action of the heart, either by some specific malady, or by general uneasiness, produce sad and dull ideas, apprehension, fear, and even despair. The first class of cases is observed among young men frequently : at the moment when their teachers praise them most, when the student redoubles his ardour for study and seems to surpass himself, then comes on that irritation which is the precursor of pthisis. The second class of cases is found among those nervous people who are attacked by chronic gastritis.

No doubt the organs of every faculty must exist, or the faculty would not develope itself, nor could irritation deprave it ; without doubt the anterior portion of the cerebral hemispheres, the organs of our moral faculties, co-operate greatly by the manner in which they modify the stimulations of the mass when it is fully developed, so as to afford a high degree of intelligence ; but we cannot believe that this faculty is so attached to any cerebral fasciculus of nerves, that it cannot be exercised by any other ; it is not likely that such a position can ever be proved. There must be a concurrence of action among many parts of the internal apparatus, and even with the extra-cranial nerves, to complete the

impressions that compose a judgment even moderately complex; especially where instinctive emotions bear a part, and where a strong impulse is given to the will. Every fasciculus must doubtless contribute in its degree; but why is not the action of some fasciculi under certain degrees of impulse answerable to the stimulations which incite us to judge, to love, to hate, in such a manner as to present an image or a feeling different from those which the same fasciculi commonly produce? Is it not a fact that an additional degree of intensity may convert pleasure into pain? As in the case of scratching or tickling. It would follow from Dr. Gall's system, that a cerebral organ would act a different part every time that new forces were added to what ought to be considered as its antagonist organ. Who has told us that ten vibrations in a given time instead of five, may not transform an ordinary man into a prodigy, by giving activity to the memory which furnishes ideas to the understanding, and which before were tardily supplied? Have we not seen a new facility for labor change the tastes and the habits of men? May not the opposite effects proceed from the same cause, as in a man already sufficiently stimulated, whom an additional stimulation in excess throws in confusion? Whoever has formed one of a convivial company of wine drinkers, will know how to judge on this point. May not an accidental diminution of irritability weaken the other faculties which were previously furnished with no greater quantity of action than what was necessary to the due performance of their functions? Are not these the kind of modifications to which we must attribute the sudden development of great talents among persons who were considered as doomed to a humble mediocrity; and the kind of bastardy that manifests itself at a certain age, among individuals of certain families? A slight affection of gastritis, or hypertrophy of the heart, a strong effort of intellect or of memory, a blow, a fall, suffice to produce improvement or deterioration in the faculties, in proportion as the result is an increase or decrease of strength, more or less mobility, an unusual relaxation, or an engorgement which impedes the contractility of the albumen of the brain; all this may take place without the volume of the brain being sensibly altered. The alteration in the size of the brain requires much time, while the changes that take place in the facility of mental operations, introducing other tastes and

other propensities, may occur within a period comparatively short.*

If the continued excitement of insanity, can relax or soften, can expand by softening, or condense by indurating the cerebral mass ; if excess of memory accompanies excess of action and contractile force ; if the abolition of memory be the result of defect of mobility, or excess of softness ; if all the other faculties are in proportion to memory in cases of insanity, why may not similar modifications take place in the normal state of the brain ?† Doubtless a certain mass of brain is necessary to the intellectual faculties ; doubtless these faculties present varieties corresponding to the prolongation of the cerebral fibres in one direction rather than another ; but these are not the only elements of the differences of which these faculties are susceptible. Action has more influence than mass, in producing great differences ; were it not so, we should not see such prodigious differences, as we actually witness. The distance which separates one man from the capacity of the common mass, is by no means in proportion to the superior developement of his brain ; and often we find among others who are inferior to him in resources, a greater cerebral mass in those parts on which the craniologists have made his superiority to depend. How many men of letters in the time of Voltaire, have had brains much surpassing in size that of Voltaire, even in those regions of the brain which correspond, according to Dr. Gall, to those faculties which he possessed so pre-eminently ?

Our well considered opinion is, that a certain developement of the brain, as the organ of intelligence, is necessary to render a man remarkable for intellectual qualities ; that the most distinguished faculties correspond, as Dr. Gall's

* All these objections to Gall's system are undoubtedly true ; but the organologists will reply, they do not calculate their doctrines on any other than the usual, normal, healthy developement of the encephalon and its envelope. The infinite modifications that may result from accident and disease, they have not attempted to embrace, or to explain. What they assert applies only to original tendencies, inclinations, propensities, aptitudes, and feelings.

There is another objection to craniology. At different stages and periods of life, our propensities and aptitudes vary ; as in childhood, in youth, in manhood, in middle age, and in old age : they change also in our passage through life according to our education, occupation, and society in all these periods ; but these changes are not indicated by any outward and visible sign.—*Trans.*

† Because these modifications imply an abnormal state of the brain.—*Trans.*

opinion is, to the developement of the anterior half of the cerebral hemispheres ; such also was the opinion of the ancients ; but we think that when the parts have arrived at a certain volume or bulk, differences arise between men that depend on other causes than volume or bulk. We believe that these differences are subordinate to the mode of action, the greater or less degree of irritability, contractility, permanent condensation, suppleness or rigidity of cerebral nervous fibre, and may vary prodigiously ;* that the movements of moveable animal matter, the movements of ponderable matter, the movements of that, *I know not what*, which pervades the nervous fibre, stand as causes of many differences ; that the stimulations transmitted by our external, and by our internal senses, the manner in which intellect re-acts under various circumstances on the one and on the other, so modify our faculties continually, that it is not possible to find any constant invariable relation between this aptitude, this propensity, this osseous protuberance of the cranium, that may be assigned as permanently corresponding.

Such are the reasons that compel us to refrain from classing monomanias, as Dr. Gall does, by cranial protuberances ; but this does not prevent us from ascribing very high merit to the labors of that excellent and indefatigable observer. The foundation of his system is solid ; we regard him as one of those who has most clearly comprehended the functions of the nervous system, and we are indignant at the levity and ingratitude with which his labors have been treated by men whose pretensions do not exceed one of his auditors, and who are indebted to him for every thing reasonable they are able to advance concerning the functions of the brain. We accuse this learned man of defects which do not relate to the basis of his doctrine ; that basis consists in a reference of every phenomenon instinctive and intellectual to the action of the encephalic apparatus ; but we think he has made that apparatus too independent, and that some of his opinions are arbitrary : the amount of our objections is, 1st, that he confines propensities and faculties within certain nervous fibres, as if these propensities and faculties were separate beings, which we have shewn is an erroneous notion in our objections to the psychologists ; 2dly, that he does not admit a concurrence of the whole apparatus for

* Gall acknowledges, that the mass being the same, the power is as the energy of action.—*Trans.*

each intellectual phenomenon, and that he establishes arbitrarily an ontological republic in the encephalon ; 3dly, that he makes his organ, act one upon the other, without the aid of this concurrence, although he has no regulating organ ; a defect of which he has been accused, and to which he has given no reply ; 4thly, that he has not admitted that a difference in vital action may establish great differences in propensities and faculties ; 5thly, that he has not put in its proper place the prodigious influence of the digestive viscera and the digestive apparatus on the encephalon ; 6thly, that he maintains that the prominences on the surface of the skull, are positive and invariable indices, and present a just measure of the affective and intellectual predominances. Nevertheless, and in spite of this last objection, we do not contest the greater part of his observations on the influence of the developement of certain regions of the encephalon on our properties and faculties : we blame him only for ascribing that influence to mass alone.*

* Gall has shewn, as many others have shewn before him, that the encephalon is a mass consisting of the organs of intellect, and of the feelings, emotions, and passions ; 2dly, that the intellectual phenomena, and all intellectual aptitude depend on the anterior part of the hemispheres of the brain ; that the feelings, emotions, passions, and propensities, depend on the posterior portion of the encephalon ; 3dly, that other circumstances being equal, the intellectual aptitudes, and the affective propensities depend on bulk or volume of the corresponding portion of the encephalic mass ; 4thly, that generally, though not always, the bony envelope or the skull, is determined in external appearance by the developement of the encephalon internally in contact with it ; but that disease and old age may sometimes occasion an alteration of the encephalic mass without altering the external surface of the cranium, if there be no continued cerebral atrophy ; 5thly, bulk, however, is not the sole exponent of aptitude, propensities, faculties, or qualities : for their energy may depend, also, on energy of vital action, of irritability, contractility, mobility, and somewhat more than usual or normal excitement. This is not sufficiently urged by Gall, but all modern craniologists are aware of these conditions ; 6thly, that perception or feeling, and all intellectual and affective phenomena, are mere functions of the nervous apparatus : just as contraction on the application of a stimulus, is a function of muscular fibre in an animal, and of vegetable fibre in the *Mimosa*, the *Dioncæa*, the *Berberry*, and other vegetables ; 7thly, that the brain is a double organ, consisting of pairs ; 8thly, that every portion of the brain and nervous system, is destined to its own peculiar duty—its own functions—and cannot perform the duty or function of any other different portion : we cannot see with the auditory or hear with the optic nerve ; 9thly, that whether any cranial protuberance be the exponent of any intellectual aptitude, or affective propensity, cannot be known by any *a priori* considerations, or by any anatomical dissections, but by actual observation and experience only, in human and other animals ; and depends on the proof by induction, and careful obser-

Conclusion respecting the Theory of Insanity.

The comparison of the post mortem examinations with the symptoms, throws light enough on the subject of insanity to enable us to advance a physiological theory of this disorder.

From the commencement of this article, I have declared insanity to be one of the results of irritation; the history of its causes, of its mode of action; the physiognomy and progress of its symptoms; every thing in short, during the life of the patient, tends to confirm my assertion. The alterations in the dead body confirm it as to the acute state, for we find the cerebral substance hardened, and intermingled with red globules in a proportion far exceeding its normal state; and the cerebral substance appears hard pressed against the internal osseous parietes, and flattened as if it had undergone a species of hypertrophy. These alterations correspond to an epoch of the disorder when there is a coincidence of great contractile force and sanguine congestion.

The chronic state offers no contradictory appearance; for the injection and opacity of the membranes, shew evident traces of irritation in the blood vessels. On the other hand, if the atrophy of the chronic state has replaced the hyper-

vation of individual cases and instances; 10thly, he has also shown anatomically, that the texture of the brain is fibrous.

Whether all the coincidences of protuberance on the one hand, and of aptitudes and propensities on the other, are well founded and fully established by Gall—or whether his divisions of faculties and feelings be correct in point of number or arrangement—are circumstances that may reasonably be doubted, without denying the fundamental positions of his system. That many of them are just, is highly probable from the number of intelligent converts he has made to his doctrine; and all the mistakes herein will probably be corrected by more numerous and more accurate observations hereafter. Craniology is yet in its infancy. All the British craniologists affect to talk of the soul, as if they firmly believed the encephalon to be a mere organ of some hypothetical, distinct, and separate ontological entity, cognizable by none of the human senses, called the soul. This I am bound in charity to consider as a convenient assumption of the orthodox and fashionable costume of the day, which the interest, the ignorance, and the tremendous power of the priesthood, has hitherto compelled them to wear. It is high time to lay it aside, and to set science free from the fetters which the clergy have imposed on it. Gall, indeed, enters not into the psychological question, confining himself simply to the functions, as matters of fact and observation. *How* the functions are performed, in a man, an elephant, a gnat, an oyster, an oak tree, or a blade of grass, are questions equally difficult, which, in all probability, human knowledge will never be able to solve; but the organs and their functions will, nevertheless, remain matters of fact.—*Trans.*

trophy of the acute state—if softness has succeeded to hardness ; if hardness, when it existed, has sometimes presented traces of morbid induration, I can see nothing in all this but the faithful execution of the common laws of all inflammations and sub-inflammations of the organs. Often, while undergoing atrophy, the brain of madmen has preserved its solidity without apparent disorganization ; a certain proof that the reduction was not an effect of absorbing any serous or purulent humor, but a sustained contractility of the whole encephalic mass ; that is to say, of a strong and durable irritation. In other circumstances, the presence of a true *pus pas* left no doubt on the existence of an inflammatory movement of that kind that we term legitimate. In all cases of the atrophy of the brain, the skull shrinks, and the protuberances become levelled on its surface, the countenance loses its expression by the progress of dementia ; but at the same time the bones have been found thick, eburneous, injected with blood, or much worn and friable. In these changes, who can see any thing but the imperious law developed in our *Physiology*, that the containing sides are as the organs they contain, if no other body be interposed ? The brain becomes condensed, the skull therefore must contract. The internal tablet at first followed the viscus, and withdrew from the external one ; but this last at length had to follow, and the external protuberances became obliterated. Dr. Gall has asserted the same thing without referring to irritation, which he had not sufficiently considered. These cerebral changes were attributed by him to disease, to the alteration in vital energy. But this is not saying enough ; this is an assertion too vague for our era. The eburneous hypertrophy of the cranium must be attributed exclusively to the propagation of irritation, from the interior to the exterior ; and as to friability and thinness of the skull, they are observed among men who have grown old in a state of dementia ; and they rank among the atrophies which succeed to the hypertrophies of over-irritation.

The inequality of bulk of the two hemispheres, seems to have been matter of surprise to some observers ; but what is there so surprising in this, in a double organ ? Did we ever find the two halves of such organs, diseased and disorganized equally ? Does not this inequality take place in all our symmetrical organs at the expense of regularity of form, when we have lived to an advanced age ? This depends,

beyond doubt, from our being incapable of stimulation equally in every part of those organs.

I shall return to post mortem dissections, by stating that effusions, infiltrations, hydatids in the membranes, general induration with or without sanguineous injection, with or without hypertrophy or atrophy, as well as the effusions and ecchymoses in the cerebral substance, and the marbled spots that have been observed in it ; the partial petrifications and softenings, arterial and membranous ossifications, and the ivory state of the brain with injection, its thinness and its friability, are the effects of irritation. All these appearances prove, that irritation (before inflammation has confounded and broken down every thing) acts as a sub-inflammation, and disorganizes each tissue in the manner adapted to the animal matter of which it is formed, and its particular temperament.

The alteration of the mucous membrane, and of the digestive canal, and that of the liver, which necessarily accompanies the former, may have appeared antecedently to insanity, and may have been accelerated during its continuance by some cause or other, so as to become itself a cause of death ; but what is certain, is, that a prolonged irritation of the encephalon cannot fail to produce an irritation of the digestive organs and of the liver, frequently accompanied by dropsy. As to the phlegmasiæ that we find marks of in the chest and the locomotive apparatus, they are accidental, and need not stop our course of remark.

Here then is the substantial part of the question. Let us now endeavor, by the aid of induction, to deduce from these facts, others less evident, which will help us to account for the former ; and for this purpose it will suffice to resume our details.

The first effect of irritation in that portion of the cerebral substance which presides over the intellectual phenomena is an excess of memory and of imagination, which is but a mode of memory. When this excess goes on increasing, sleep diminishes or becomes almost like wakefulness. The exuberant intercranial activity recalls old impressions and combines them in ways new to the consciousness of the individual. He sees, he feels arising within him this new trouble, and he is deceived also by hallucinations of which the cause seems exterior to him, while it is in fact nothing but cerebral irritation. He shudders when he reflects that he has almost

given credence to chimeras, and to strange associations of an exalted imagination.* He deplores his situation while he feels them forming and remaining in spite of himself, and even at the moment when he is most anxious to be delivered from them. Thus much we have said already : let us advance another step.

That which hinders him from believing all this, is the remains of the moral action of the encephalon ; but the abnormal action at length prevails ; and from that moment, reason, which was attached to the normal mode of action, existing no longer, consciousness becomes deceptive, and the will is depraved, because it no longer obeys the individual consciousness of the normal state. In fact, consciousness and identity are so depraved in complete insanity, that the patient no longer feels his proper relations to his fellow creatures. It is not the identity of health, which the insane observer finds within himself, but it is a false identity, a false consciousness operating on ideas dissimilar and unconnected, or similar and consequent, but founded on false principles. Such are the indications of the highest degree of the general malady.

When insane persons of this description preserve the recollection of what they have said or done, we may believe that their individual consciousness is only oppressed, not destroyed ; but this is not the case when the agitation becomes extreme : they cannot recollect what they have said or done too precipitately ; they resemble men drunk, or transported with rage, and they quickly forget what they have said or done. Such also is the case with frenetic madmen. Self reflection, and by consequence the recollection of what he has been intellectually, is wanting to a man when his mental operations exceed a certain degree of precipitation. The memory of the access of insanity being frequently deceptive as to many scenes of their delirium ; does not furnish any proof that they preserve their consciousness of individuality.

*Does not all this prove incontestably that sensations and ideas are nothing more than motions in the brain, felt or perceived ? Yet, with a flippancy equalled only by his ignorance of all intellectual physiology, did a reviewer in the *Edinburgh Review* for October, 1806, p. 159, almost laugh outright at the absurdity of such a supposition : as fully proved as any physiological fact can be.—*Trans.*

When an insane person, recovered, relates what he has done, and declares that he has been deceived by false images of things; when he proves that his conclusions from the facts which seemed real to him, were properly deduced; in a word, while he preserves the remembrance of the fit, we may believe that he preserves his feeling of identity, but that his consciousness has been cheated by false images, the result of cerebral irritation. But when he is alternately reasonable and insane, or reasonable on one point and insane on another, without any possibility of disabusing him, what, in this case, are we to think of his identity (*moi*) and his consciousness? Is it enough to induce us to believe that a monomaniac is reasonable, that he can judge accurately of the temperature or the shape of a body? Can we conclude that he possesses a consciousness of his identity (*de son moi*) because he gives proper answers in relation to his wants? Suppose we grant thus far, where is his reason, and his self consciousness, when he declares that he is a dog, an owl, a bottle, a leathern jug, a mile stone, a grain of mustard, &c.? Will it be said he has a double *moi*, a double consciousness, the one for just ideas, the other for false ones? In the case, for instance, of a patient who believes himself to be some animal, we may in strictness allow him the identity of a dog or an owl, but what are we to do with the identity of a mile stone, or a bottle? If we refuse him the double identity, the double consciousness, will it be pretended that he possesses only the consciousness of a normal state obscured by disease? Two replies may be made to this:

1st. We may allow a consciousness oppressed by disease to one who furnishes occasional proofs of reason; but can we make the same allowance to one who for many years has furnished no such proof? Where is the identity, the consciousness of a man in a state of dementia, who, after having long lived in a state completely brutish, dies without having afforded any proof that he has retained his reason? Some there are who have recovered it at the last moment, but whither had it retired during so long an absence? The malady had repressed it, may be the reply: well; I proceed then to the second answer.

2d. In advancing that identity (*le moi*) and consciousness have been repressed by the malady, let us know distinctly what the malady is. We may conceive of it as of a

Being of determined figure, which compresses or oppresses another Being equally marked and determined, called moi, myself, or else another Being of the same nature, called consciousness. How then are we to represent this moi, this consciousness, and this malady, so as to assert any thing reasonable concerning them? I shall not push this discussion further, contenting myself with a reference to the first part of this work; but we may conclude from what has been advanced, that if we would avoid ontology, we must not assert generally and absolutely that an insane man preserves or has lost his reason, that he preserves or has lost his consciousness of identity (*de son moi*), that the feeling of identity is oppressed under the weight of a malady, and that its tendency is to re-establish itself, as takes place after cure, and sometimes at the last moment of life; that if it does not appear, it exists nevertheless, since it is a simple substance, indestructible, &c. Metaphorical language like this, teaches nothing, and only prolongs the reign of illusion, and adds strength to fanaticism. We must speak simply matter of fact: we may say that a madman sometimes has reason and sometimes not; that he sometimes has, and sometimes has not self-consciousness; that when he is cured he recovers his reason, and that he may sometimes possess it a short time before death, but that he often dies without ever recovering it; that the cause of these differences lies in the words *reason*, *self-consciousness*, which in fact express nothing but the action of the nervous substance of the encephalon, an action liable to change so long as life remains. To this we must add that as the patient neither enjoys the faculty of reason constantly, nor always correctly, he has no regular normal relation to other men.

As to the explanation of this moral state so variable, we ought to say, that after having received light from the causes of this disorder, from its progress, and from post mortem examinations, that when the brain is vividly irritated, the insane person has neither reason or consciousness; that when the irritation is moderate, he has both; but when great irritation again takes place they disappear, as in sleep, or if you prefer it in apoplexy. When reason appears again for a few moments, just before death, it is in consequence of the ceasing of the morbid excess of irritation in a brain not yet completely disorganized, and this is the last part which irritation performs in all cases of de-

irium, and this is all we can say of this last moment of life's duration.

As to madmen who are convalescent, and whose malady returns after conversations too exciting, or liberty given to them prematurely, we may properly say, that the exercise of their reason and their consciousness, as well as the application of the one and the other to the actual impressions of their senses, are so many cerebral *stimulations*, which, when converted into cerebral *irritations*, banish reason, consciousness, and identity, (moi) or if you please, the normal type of encephalic action, on which these intellectual properties depend. When reason is not present, as in madmen under general insanity, this normal type does not exist; when reason appears but by intervals, and when it disappears on the slightest irritation, there is no regular assurance of the possession of this normal type, but it has existed; it is lost therefore; but in the native idiot who has never possessed it, he cannot have lost it. Such are the grounds and reasons which have induced me to adopt the definition of insanity, which I have already given.

Let us add, for the purpose of giving additional force to these truths, and connecting them still more strictly with physiology, that in chronic irritation the contractile force is not destroyed while memory remains unaltered; for the weakening of this faculty is the first indication of the diminution of this force, but the morbid habit, after some time, renders it incurable, when it is not so rendered by disorganization; that the whole mass of the brain is disordered more or less even in monomaniacs, which, under this view of the fact, are not to be regarded as partial affections of the brain. We rely for proof on the fact, that monomaniacs are intellectually weak in all respects; that they change their object; and on the fact that anatomical pathology has not yet settled a coincidence of an alteration of any part of the encephalic mass, with any specific form of delirium; and because dementia, when it takes place in monomaniacs, is never confined to subjects affected with partial delirium; because it is always general, and begins by a weakness of memory, whatever may have been the kind of delirium, and even when there is no other encephalic lesion than a diminution of muscular force.

We assert also that if you observe persons insane with dementia play at draughts, or music, it is because the de-

mentia is not yet complete. Indeed the diminution of contractility is not perceptible at first, but by a diminution of the most complicated intellectual operations, such as a judgment requiring the bringing together of a great number of perceptions; for this reason, the memory of complicated abstract ideas, and judgments of deduction, are first weakened and first lost; but it takes more time to destroy those ideas which belong to simple combinations, and actions which approach to the character of instincts.*

Dementia analyses, to a certain degree, our faculties by the successive manner in which it destroys them. When the intellectual portion of the faculties, or the mode of cerebral action on which they depend no longer exists, the weak-minded patients abandon themselves to instinctive actions, the most gross and disgusting; and often the most opposite to their normal propensities: this proves the depravation of instinct; but if they continue to live for some time, dementia deprives them even of instinct and volition, and reduces them to a state below the zoophyte, or even the vegetable;† an observation of great value to the physiologist, since it shews him to what point the nervous system becomes necessary to the functions of animals in whom it is much developed, and particularly in man.‡ Physiological physicians may also make much use of this fact, to confirm what we

* Perhaps it will be objected that draughts require considerable combinations: the best players I have seen were sots.

† See before p. 393, for a deplorable picture of the last stage of those weak-minded patients, who, by aid of accidental circumstances, live on, until the natural turn of their cerebral affection cuts them off.

‡ We are not ignorant that many animals, zoophytes, &c. observe and seize their prey without possessing a nervous system. The reason is, that in these animals the nervous matter intermingled with the other forms of animal matter, suffices to the small number of actions which they have to perform. The medium in which they live abundantly supplies them with nourishment, and the irritability of their fibres affords them the means of seizing their prey. But in proportion as the necessary acts of alimentation and reproduction multiply and become more complicated, the nervous matter becomes separated from the other tissues, more abundant, and exercises more influence over the functions. Finally, among men it is thus to such a degree that life itself cannot be maintained but by innervation, and what is more, without sensitive phenomena.—(Author.)

This is an ingenious supposition as to the physiological source of the slight degree of voluntariness perceptible in zoophytic animals, but it is supposition only.—*Trans.*

have already stated of the part performed by the encephalon and its dependencies in the numerous morbid sympathies which our predecessors would not undertake to explain.

CHAPTER VIII.—PROGNOSTIC OF INSANITY.

The prognostic of insanity is deduced from its causes, the constitution of the subjects, the mode of its first access, its progress, and its complications.

Insanity, from accidental causes, always presents more favourable chances of cure than that which arises from some innate disposition, and wherein accidental modifications have only acted as determining causes. Among these last, moral circumstances are the most formidable, especially when they have been long in action. But when a long series of mental grievance has been complicated with a chronic affection of the digestive passages, the cure is always more difficult, because the two kinds of stimulation mutually act upon and keep each other in action. Such is the case of persons who have long lived in habits of intoxication ; it is even supposed that they may transmit this pre-disposition to their children, but I consider this as a conjecture hazarded. It is more frequently the case that a bad conformation of the brain, disposes men to insanity and to gluttony ; and it is this pre-disposition that is transmitted from father to son.

Insanity arising from purely physical causes, as the suppression of a flux, the repression of exanthematous eruption, &c. yields for the most part, to judicious treatment ; moreover, there is neither complication, or hereditary source, or moral or physical causes of insanity of which we have not given a detail. The most difficult cases, are those where insanity succeeds to an illness which has affected the cerebral organization, such as epilepsy, palsy, apoplexy, &c. : in this case dementia is not long in appearing.

When insanity makes its access, impetuously in a fresh subject, we are much less uneasy as to its result, than when it announces itself by a want of memory, a difficulty in pronouncing certain words or syllables, and by some transient illusions which the patient himself perceives, and by an effort of attention is able to avoid.

These indications which generally occur after some efforts of mental exertion prolonged, after mental uneasiness, and pains accompanied with weakness in the muscles of the back

and extremities, often with trembling and convulsive shuddering, announce that the contractility of the brain is already exhausted by irritation, and that the patient will soon fall into mental alienation and general paralysis, whatever may be the cause of his present enjoyment of health. This form of access is more common in old age than earlier : if to this be joined a disposition to loquacity, hallucination, a gaiety without adequate cause, and incoherent proposals, we may expect the mental alienation of old age, properly so called.

When a robust patient becomes insane by complete insensibility, resting immoveable, with his eyes void of expression, refusing to eat or drink, we cannot but attribute this to a sanguineous congestion in the brain ; and this, whether the person affected has no ideas, or has them so confusedly that he feels no motive for action, or that some predominant idea absorbs all his attention, or is of such a nature as to hinder him from walking or taking nourishment ; as for example, if he believes that he shall break to pieces if he walks, or that it is all over with him if he speaks, &c. In each of these cases the disorder is not desperate. Frequently the calm state of stupidity, is the forerunner of some violent fit. In other cases more rare, insanity continues under this form, but the patients are sorrowful, they shed tears, and believe themselves lost or ruined. We judge of the probable issue of the disease, by estimating the strength of these symptoms.

That insanity which persons who have become melancholy by love or any other cause, have concealed for a long time, but which now and then betrays itself, may break out with violence : and if the subject be yet robust, we may have reasonable hopes of cure. But if the disorder be recognized only by loss of memory, and other signs already noticed, we may conjecture that the long strife which the patient has undergone with his disorder, has worn out the contractility of the brain, or that some disorganization has taken place there, and dementia may be expected.

The more robust the subjects are, the less reason is there to expect dangerous occurrences, if there be only congestion or acute inflammation of the brain, which may be reduced by blood letting ; but we have every thing to fear where the patients are weak and sickly, of a soft fibre, and in whom moral affections are apt to produce violent effects : such persons are subject to relapses, and frequently fall into imbecility.

The prognostic data, drawn from the *progress* of insanity are perfectly in harmony with the preceding. General mania with inflammatory symptoms, accompanied also with great agitation, gives us hopes for a long time, even when the patient listens to no reason, seems always occupied by chimeras, and readily becomes furious. We have seen this cured even after many years, as we have said before. Hence, although no cure should take place within the first half year, the usual period of hope, we may, nevertheless, have hopes for one or two years, or even longer; for such instances have occurred even after ten or twenty years of mental alienation. Partial mania or monomania, is often more obstinate, because it is often more chronic: it is more particularly to be feared when the ideas which sieze hold of the patients, are of an irritating description, or hinder them from taking nourishment, or speedily exhaust the vitality of their nervous system: these cases are still more formidable, if accompanied by an inveterate gastro-enteritis. In this rank we may place religious delirium, such as when the insane person believes himself possessed with the devil or plunged into hell. This demonomania is one of the most formidable when accompanied by marks of violent despair, when we see the patient with haggard eyes, a face hideously distorted, the hair standing on end, and refusing all the care we wish to bestow on him. But when he becomes familiarized with the devil, or believes himself to be an evil spirit, when he laughs and appears unconcerned, the prognostic is no longer drawn from the kind of delirium, but from its complications, the strength of the patient, and the state of the memory.

In truth, it is the memory and the attention, that furnish the principal grounds of prognostic in insanity, when the disease is already in an advanced state. While memory exists, and the patient does not fall into stupidity and unhappiness, while he is able to give attention to what is said to him, we need not renounce hope; whether he connects your conversation with his chimerical ideas, or answers with propriety, and does not appear to wander except on the accustomed subject of his disorder.

So soon as memory begins to weaken among insane people, and the power of attention is destroyed, they find themselves, as we have said before, delivered from the cares which their exalted imagination had created, and which

proved an obstacle to their taking nourishment. From that period, assimilation takes place more easily, and they are no longer affected by chronic phlegmasiæ of the digestive canal; they fatten, they acquire color and freshness of complexion, but without any expression. If, therefore, we do not observe this amelioration of the nutritive functions, it is a bad symptom, and we must satisfy ourselves which organ it is, whose irritation can keep up meagreness, want of color, &c.

This super-nutrition, which is commonly remarked in dementia, is not without its inconvenience; it often prepares the way to returns of agitation with inflammatory symptoms, during which memory is absent; it is therefore no presage of cure. This super-nutrition also causes epilepsy and formidable apoplexy. At other times these madmen live long in this state, fat and voracious; but they always end by general palsy, by irritation, by engorgement, and by chronic phlegmasiæ of the digestive organs and the liver. The marks, therefore, of this consequent gastro-enteritis, should be considered as lamentable; they presage engorgement of the liver, icteritis, dropsy, and diarrhœa, which bring on the death of these patients. Many succumb under gangrenous eschars and their consequences.

The frequent returns of agitation, even with inflammatory symptoms in an insane person going onward toward dementia, are by no means proofs that his disorder is curable: we had better refer ourselves to the memory and attention. We have said that these exasperations are generally more common in extreme cold, and very hot weather, and at the seasons of equinox, than at other times; but all accidental excitements, moral or physical, may bring them on, though they are more to be dreaded when they appear without provocation. These accesses are of good augury in a madman, whose malady has broken out with torpidity; for it is a general law in pathology, that a reactive movement neuro-sanguineous, shews itself at the moment when congestions disappear. All we could wish is, that these reactions should not last more than a few days; but they are unpleasant symptoms in madmen who are in a convalescent state; for they are proofs of a return of cerebral irritation which induces new fits of delirium.

Intermittent insanity, gives us at first some hope when the patients exactly conform to the prophylactic directions of their physician; but when this insanity is inveterate it is

difficult of cure. There are periodical irritations that produce delirium, as there are some that bring on the epileptic congestion. The longer they have lasted, the more likely is their recurrence. Intermittent irritation of the encephalic apparatus ends as in all other viscera, by establishing itself continually ; and when it has put on this form, dementia, that fatal stage, is not far off, if it have not already appeared.

On the same principles we are to form our judgment concerning relapses which do not assume periodicity. Each attack producing some new injury to the brain, we may expect as many obstacles to the cure of the disorder, as there have been relapses. For the most part, partial insanity, tends to become general ; and all general insanity tends toward dementia and general paralysis. Our judgment, as to the approach of this fatal termination, must be drawn from the state of the memory, and muscular motion.

Of all the possible complications in mania, the worst are epilepsy, chronic phlogosis of the digestive canal, and chronic pneumonia.

The first of these is nearly allied to insanity ; it frequently precedes and determines it—at other times, it arrives as a complication at a period more advanced. Solitary pleasures to which the insane are so addicted, are often the determining cause. But, mania being an irritation of the brain, what is there surprising that it should increase occasionally, and determine that kind of cerebral congestion which brings on fits of epilepsy ? In every case, epilepsy makes the patient liable to the hazard of formidable attacks of apoplexy ; and even when this last does not occur, it hastens the approach of dementia and of palsy, general or partial.

The phlogosis of the digestive canal, may at first produce either want of appetite, or voracity ; sometimes jaundice and ascites ; it commonly finishes its career in the large intestines, and kills the patient by diarrhœa. All these complications are fatal, when they attack an insane person already for a long time in the chronic stage, or worn out in a short time by furious madness, and an agitation that no remedy can appease.

Chronic pneumonia causes the ulcerations, and the pulmonary pthyses, which we remark among insane persons, succeeding often to repeated bronchitis, or catarrhs, which they are unable to avoid when incurable ; for, being disgust-

ing, dirty, ungrateful, ill-dispositioned, and even dangerous, these unhappy persons are deprived of all those minute attentions which might prevent the consequences of rheums and irritating coughs to which they are subject. Frequently, when first remarked, chronic pneumania has already made so much progress, that the aid of medicine is unavailing.

When insane persons have long suffered rheumatic and gouty pains, which the cold and damp of their apartments render them subject to, we ought to be on the watch, lest these irritations should penetrate within, and disorganize the heart, under the forms of pericarditis or aneurism, and the lungs under the type of chronic pleurisy, or pthisis pulmonalis. It would be much out of place, on such an occasion, to attribute to them a peculiar vigor for resisting cold, which insane persons never possess but during the period of excitation.

The same causes, and others, expose them to intermittent fevers, and to acute plegmasiæ of the larger viscera; disorders always dangerous to them, because the chronic irritation of the brain may in consequence become acute, and carry them off with symptoms of what have been improperly called cerebral fevers, putrid, ataxic, or malignant fevers.

If we judge of the possible recovery of insane patients, by the proportion of cures published in the different treatises on mania, we shall find that in the best regulated establishments, from one fourth to one third are cured. If we seek after the data in reference to age, we shall remark, that from the age of ten to twenty years, more than half the patients are cured; from twenty to thirty, not so many; from thirty to forty, still fewer; from forty to fifty, not more than a third; from fifty to sixty, somewhat less; from sixty to seventy, not more than one in seven. Women are more easily cured than men. Let us hope that the improvements due to physiological medicine, so manifest in other disorders, will be apparent also in this. I may add that I am in possession of a sufficient number of facts to justify this cheering expectation.

CHAPTER IX.—ON THE TREATMENT OF INSANITY.

Ancient practice brought against insanity nothing but bleedings, and drastic purgings, chiefly with hellebore; they used also the cold bath, and particularly bathing by surprise, which consisted in plunging the patient in cold water.

then taking him out, and repeating this process several times. Some earlier authors pushed this violent remedy so far as to keep the patient sub-merged till he had repeated the psalm *miserere*. Their intent was to produce effect by the fear of death. When these remedies failed, they had recourse to shutting up and exclusion. For many ages a madman was considered as so incurable that it was regarded as a very fortunate circumstance, if a few instances of recovery could be cited.

In the middle ages, those times of fanaticism and ignorance, demonomaniacs were common; but they were delivered over rather to the priest who exorcised them, than to the physician. The pretended cure of some money seeking rogues, brought the clerical treatment into vogue to the detriment of medicine, which made no progress in this disorder.

The decline of fanaticism in Europe, did not contribute to ameliorate the condition of insane patients. When exorcism was laid aside, they were still ill-treated, loaded with chains, and beaten like culprits. It was not medicine that prescribed these cruelties; but medicine, from want of knowledge, was not always guiltless. Furious madness, and the agitations of the first access, were attacked by bleedings, by drastics, by cold bathings, cold affusions, and applications to the head; but if success was not the speedy result, the patient was released from the doctor, and delivered over to keepers, themselves not watched, who were irritated against the patient for the most trifling causes, and who inflicted on them cruel punishments. There are still lunatic hospitals in many of the great cities of Europe, where stripes still constitute a part of the treatment.

Such was the condition of insane persons in France, (that is to say, copious bleedings, drastic purges, cold affusions on the head, baths of surprise, confinement and exclusion,) when PINEL became a physician to the hospital *Bicetre*. His goodness of heart revolted at the ill treatment of insane patients, and at the abandonment to which they were consigned when the first means of cure had failed.

He composed a treatise, constituting his high and most worthy claim to public applause, wherein he called the attention of observers to this species of malady too much neglected: he shewed that, by treating insane people with more humanity—by preventing in them, by means of kind

and soothing expressions, the feelings of distraction, humiliation, shame and despair, feelings that always arise on the first glimpse of returning reason—by saving them, also, from the violent treatment of drastics, of blows, and the dread of cold bathings, which shook their nerves, already weakened by excessive bleedings—by reserving the cold affusions as a means of correction in certain cases—and by gentle treatment generally, he produced a greater number of cures than had usually taken place. Two leading ideas were observable in his work: to connect the maniacal ideas, hitherto confused and unintelligible both to physicians and philosophers, with the intellectual and affective faculties recognized by Locke and Condillac; and to regulate the treatment according to the views of hippocratic expectation, founded on the periodical efforts of nature, and the production, more or less regular, of crisis. These novel views, developed with a tone of conviction, and with the enthusiastic energy of enlightened philosophy, produced a great effect in the learned world. Insanity became on all sides an object of attention; facts were sedulously collected; insane persons became objects of great interest to physicians, who soon communicated the impulse to persons in authority. The lot of madmen became ameliorated; and if Pinel himself did not make great progress in the medical treatment of this disorder, he had at least the satisfaction, before he died, of contemplating the happy effects of the impulse he had given to public opinion.

What I have said on the divisions of which insanity is susceptible, in reference to its physical and moral relations, will dispense with the necessity of discussing the opinions of M. Pinel, on the analysis of the faculties of the understanding, as deduced from the various kinds of insanity. I shall, therefore, confine myself to the treatment of this disorder, which I consider as at present too inactive. No doubt it is better to abandon insane people to the influence of regimen, than to wear out their strength by enormous bleedings, to torment them by the dashing of cold water and the dread of immersion, or to inflame their digestive organs by violent cathartics. But is there no middle way between these torments, and the inertness of hippocratic practice? I think there is; and I am now about to relate my own experience, and that of some of my friends who have applied the precepts of physiological medicine to insanity.

First, let us fix the indications.

Insanity is an irritation. To combat it, we have two kinds of modifiers, sedative, and counter irritants; also, and more usually called revulsives. If we assume here, as we ought, the disease at its first access, and in its highest grade, we shall see it accompanied by inflammatory symptoms; we shall have to fight with encephalitis. We must resort therefore to bleedings, abstinence, emollient drinks, and the application of cold. There has been too much declamation against abundant bleedings, since Pinel and his school have been so sparing of the blood of insane patients. Hence, they never relate a case of sudden cure; while the physiological physicians may cite many cases where bleeding, and especially leeches applied during 3, 4, or 5 successive days, have removed a commencing insanity, as we remove a commencing pneumonia, or gastro-enteritis, and restored the patient at once to his reason. There already existed facts that would point to this practice, but it was necessary to choose the good and reject the bad. In the time of Desportes the average period of treating curable insanity was 150 days. In 1822, at the Bicetre* it was 130 days for men, and at the Salpêtrière 145 days for women. Instead of being astonished at the happy results obtained by the method of practice of Desportes, and attributing the reverses to the debility of the patients, it would have been more just to ascribe them to the agitation produced by cold water, to ill treatment, and the consequent feeling of despair, and to the irritation of drastics administered without regard to the susceptibility of the digestive organs: it would have been possible to hit upon a proper middle course, and to have combatted the cerebral irritation during the first days of its appearance by bleedings proportioned to the strength of the patients, instead of permitting them to remain in a state of delirious agitation, that the disorder *might run through all its periods*.

Copious bleedings are not always without danger in delirium attended by convulsive agitation. I have seen in the old practice, men attacked with acute febrile delirium, and convulsive trembling, after excess in alcoholic beverage, die suddenly a few hours after bleeding. I have collected already five or six cases of this kind, where death has oc-

* Lunatic Hospitals at Paris. Broussais is attached to the Hospital of the Val de Grace, which is not a Lunatic establishment.—*Trans*,

curred very shortly in the practice of the late M. Corvisart, who did not adopt the system or the denominations of his colleague Pinel. He did not call them *ataxic* (irregular) fevers, but *malignant fevers*. He saw in the delirious state and the redness of the eyes, signs of an inflammation of the brain, complicated with *essential fever*; and before exhibiting camphor, kino, and ardent spirits against the malignant symptoms (for he prescribed these also) he opposed a bleeding in the feet to the inflammation, and his patients often died in a day's time.

The same check may occur in mania: one of our colleagues, Dr. Pressat, who owed his astonishing success to his anti-phlogistic treatment, made a judicious remark respecting it. This enlightened physician deemed it proper to give calming beverage to subjects seized suddenly with furious mania after an indulgence in spirituous liquors, and to let the pulse rise again, during some days before he ventured on blood letting. The more you bleed these sort of madmen, the more furious they become, and fall at length into a mortal collapse. This remark deserves the more attention as it comes from a practitioner, who has frequently removed the early stage of insanity by general and local bleedings, just as incipient pleurisies and gastro-enterites of an acute type are cut short by like means.

After bleeding from the large vessels, come the capillary bleedings. Leeches and cuppings on the passage of the jugular, and on the head after shaving, at the base of the skull, on the occiput, and in all those places where more than usual heat is felt, or where the patient feels pain, and even in places where the skin is too sensible, in the nape of the neck, and between the shoulders after the manner of Cælius Aurelianus, are all means of considerable efficacy. They must be employed as long as the strength of the patient can support them in all recent cases, and even in exacerbations; joining to these means others that are accessory.

The principal are, warmth applied to the lower extremities by means of the half-bath of 25 or 26 degrees (80 of Fahr.) while warm water is poured gently on the head and near to it. This is bathing by affusion; a practice not less useful in this case than in acute cerebral inflammations; but it must be patiently persevered in.

If inflammation of the stomach be conjoined with maniacal delirium, it must be attacked without loss of time. If it

have preceded and determined insanity, after general bleeding we must apply leeches repeatedly to the epigastrium, before, and even concomitantly with their application to the head.

If insanity does not yield to these means, seconded by abstinence, cool beverage, such as orgeat, gum water, lemonade, &c. the patient becomes calm to a certain point, and is usually seized with a strong appetite, which it would be dangerous fully to indulge, and equally so to enjoin a rigorous abstinence. The diet therefore must be vegetable, fœcula, leguminous, vegetables, and fruits. Milk may perhaps be allowed, but animal food must be deferred.

It is at this period, after the decline of the violent symptoms, that the patients dread cold, which during the exaltation of the disorder they braved. As some of them have died by the sole influence of cold, precautions must be taken to prevent this mishap. This is a remark of Pinel.

The most pressing symptoms having been calmed by this antiphlogistic treatment, the causes of the disease must be enquired into for the purpose of deducing curative indications. Suppression of habitual hemorrhage requires a re-establishment of a flux which has become necessary to the equilibrium of the functions. We may succeed in this, when the larger viscera have not received any formidable injury, by dissipating their irritations, and recalling the usual flux by leeches applied at or near to its former locality at the periods when it usually appeared. Repelled exanthemata and inveterate discharges, demand the application of issues, cauteries, or setons; or at least, the employ of vesicating ointments, and emplastic applications, as rubifacients to the skin, or to excite pustulous eruptions.

Purgatives are sometimes useful; but they are not to be used until by general or local blood-lettings the stomach and intestines are put into a state to support, without inconvenience, the action of drugs destined to promote alvine evacuations; nor can we insist on these means as absolutely necessary. We must not forget that the employment of violent purgatives is the result of a false theory, rather than of experience, and they have been kept in vogue by a success ill interpreted. Some of them, such as hellebore, have been reputed hydragogues, and as the brain was considered as a cold organ, obstructed by pituitous humors, it was deemed a happy thought to draw these humors to the lower

intestines, and thence expel them. Some cures (the effect of a happy revulsion) have rendered this a deep rooted prejudice, which has continued to our own day. Physicians no longer employ drastic purgatives in cases of insanity; they are content with mild cathartics when such evacuations are required. For our part, we do not approve of this practice, or of the use of emetics; gastro-intestinal irritations in lunatics are to be appeased by local bleedings, and to be prevented by a severe regimen. It is always hurtful to make the digestive canal the centre of an habitual flux. The embarrassment which physicians experience, has induced them to employ emetics in large doses, as a contrastimulant, on the theory of Rasori. The experiments which have been already instituted on this plan, have been such that the practice has been dropped.

Diffusible antispasmodics, opium, musk, and all the class of fetid medicines, have had but little success in mania. Opium, above all, is dreaded, because it tends to produce sanguineous congestions in the brain; but after sufficient bleeding, it may be given to certain subjects to lessen the excess of nervous debility. Dr. Pressat thus uses it advantageously in his establishment near the Barriere de la Trone; I have also used it successfully in private practice, after blood-letting has been pushed as far as was prudent, whenever nervous mobility and convulsive tendencies formed the predominant symptoms. Among the substitutes for opium, the extract of *hyoseyamus niger* (*jusquiame*) may be used, but the belladonna is too irritant on the brain to be trusted.

Digitalis has not produced in my experience, any success worthy of notice. At present, practitioners resort to the hydrocyanic or prussic acid, in acute encephalitis. It is not a medicine to be relied on, and it must be exhibited with great circumspection on account of its deleterious properties.

Quinquina has been tried in periodical mania; some cures are due to it, but it is not a certain medicine. In such cases, the better practice is to remove the causes of disorder, to recur to sanguineous evacuations at the approach of the period of relapse, and then to apply revulsives on the external surface by the different methods we have spoken of, or by those which we mean to recommend.

After medicine, come the hygienic means of restoring health, at the head of which we ought to place the moral treatment. The first article of this treatment is confine-

ment. It is necessary, at first, to separate the patient from the persons with whom he has been accustomed to live. If he lives in the midst of his family, he is always more imperious and difficult to manage; his violence is at its height by the resistance he experiences, and if he finds that he is obeyed, his arrogance becomes insupportable. These two extremes only exasperate the irritation of the brain, and render the cure more difficult. Moreover, a prompt and decisive repression is necessary to calm the violence of the access, and this cannot be effected conveniently, but by and among strangers. A feeble resistance to them exasperates maniacs. But a force manifestly superior, calmly employed, and founded on justice and reason, produces an instant effect, and greatly diminishes the violence of the cerebral innervation. In spite of the illusions that seize hold of their attention, in spite of the powerful reasons that they think they have to treat all the world with haughtiness, and to do as much injury as possible, the greater part of madmen, have not entirely lost all sense of justice. Some remains of the normal type of cerebral action appear from time to time, and allows them to perceive what is unbecoming or blameable in their conduct; and if it is always at a proper time and occasion that they are seized, shut up, and confined in a strait waistcoat, far from being exasperated, they are calmed by it. On the other hand, if they are so much deranged as to be insensible to what is proper for them, there is no risk ran in resorting to these methods, taking due care that they are not hurt or wounded. These means of repression, which the wise Pinel substituted for stripes and chains, with which madmen had been loaded, are almost the only means now adopted in France, and it is observed that violent madness is less frequent and more conquerable than aforetime. The affusion of cold water on the head, is the only harsh means now resorted to. The patients are made acquainted with it in the outset, and it is used as a bugbear to repress their violence, and deter them from bad actions. Madmen resemble those profligates of 14 or 16 years of age, who are pushed on to improper conduct by some secret instinct: although they know they do wrong, and in private condemn themselves for doing so, they constantly tend to the practice by a pleasure more seducing than any other. Their enjoyment is founded on the chagrin and anger of others, and it is characterized externally by an ironical

smile ; it is malice. In every instance we observe a degradation of the feeling of self-respect accompanying imbecility of reason. This state, in young boys, proceeds from an imperfect developement of the encephalon, but in madmen it is the effect of irritation. Both of them have a brain too excitable, and want the type of reason ; but they differ essentially in this, that in the healthy boy, the irritability of the encephalon is normal, and tends to diminution as the region that presides over intellectual operations acquires gradually a predominance ; while, among insane persons, the irritability is morbid, and tends to deprave the organs of intellect, as well as of instinct. Neither the one or the other are in a stationary state ; but nothing more is necessary in the boy, than to favor the actual progress of organization, while in the other, it is necessary to repress it.*

When the agitation ceases, the time for repression is over, but not so the time for reclusion. The ^{now} patient must be watched, and it will soon be discovered whether he may prudently be released from confinement. Particular attention must be paid to those who are afflicted with the mania of murder or suicide, for this propensity is apt to be renewed after long interruptions, and these maniacs know how to dissimulate to inspire confidence and obtain the liberty necessary to execute their projects. Their coolness in this respect is surprising. As gastritis frequently brings on these atrocious inclinations, the physician should remove every trace of it. A cautery, or issue, placed under one or other of the hypochondria, may contribute to destroy these obstinate irritations. A seton in the nape of the neck, after sufficient bleeding, will also be useful where the insanity has become chronic, for the purpose of preventing those encephalic alterations which are apt to bring on dementia and general palsy. Pinel introduced the custom of classing the patients, and of keeping one class separate from another. His worthy successor, Dr. Esquirol, followed his example. The first division is that of the sexes : there should be also a division for furious madmen to whom a strait waistcoat is necessary, that they may be confined by bandages to a bed or a couch, constructed for the purpose. 2dly, a division for madmen, not dangerous, but agitated ; these may be

*Consult the *Traité de Manie* of Pinel ; the large *Dictionary of Medical Sciences*, the *Dictionary of Medicine*, in 18_vols. (French,) and the work of Hofbauer.

merely shut up. 3dly, a division for those affected by mental imbecility and alienation, (dementia,) including those who are dirty and paralytic, and to be governed as children. 4thly, a division for insanity, complicated with accidental maladies, as pneumonies and intermittent fevers. 5thly, one for convalescents and quiet patients, who may be allowed to walk in the garden, and who return to their apartments of their own accord. Distinctions are necessary among these, for among them will be found monomaniacs ; and if you permit those who are insane upon the same topic to associate, they will excite each other either by applauding or contradicting, and they may pass to a state of exaltation or violent anger that retards their cure.

But as to the rest, we do not often remark this occurrence. Insane people are egoists, and avoid each other ; each is so much occupied with his own chimera, that he pays little attention to his companions in misfortune. One will walk with quick step, conducted by imaginary beings which he sees around him ; another retires into a corner to contemplate at leisure, the fantastic objects of his imagination, and converse with them at his ease ; a third sits silent and immovable, seemingly absorbed in profound meditation, although he often thinks on nothing, as Dr. Esquirol has well said, in the picture he has drawn of a lunatic hospital. (See Dictionary of Medical Sciences.) All of them are in a state of defiance as to the rest, they mutually despise each other, and each thinks himself the only reasonable being among them ; for they all know that they are in a house for lunatics, but they regard it, as to themselves, as an injustice, and that it is by the contrivance of their enemies, or their relations, that they are detained. We must not, however, conclude from thence, that their remaining in such a place is an obstacle to their cure, or a reason of disgust to their families. Insane people pay too little attention to insane people to be unfavorably impressed on this score ; and if they were at home, they would act in the same manner toward their relations and friends ; for the circumstances of retention or reclusion, which they must submit to, would be sufficient to excite their resentment ; they would be equally enraged against the tyranny of their relations, and the disobedience of their inferiors ; their haughtiness would be humiliated by the resistance, or by the commanding tone of their domestics, &c. The quality of insanity is to deprave

the affections as well as the understanding, and experience proves that when they return to their senses, insane people retain no animosity against those who caused them to be confined.

So long as insane people do not lose their memory and attention, they quit their disordered series of ideas when they are questioned, and reply properly to the questions put, during some time longer or shorter. The persons thus circumstanced are not to be regarded as hopeless. Putting aside all the personified abstractions, called faculties or principles, and all merely ontological considerations, that we may dwell only on the facts observable, we find that a person becomes insane because his brain is over-excited. Of course, the first indication is to calm that organ by all the means that experience dictates. When this first indication has been fulfilled, attentive observation teaches us, that although the brain has been over-excited, yet it may be possible to put the man's thoughts in the usual and normal course by impressions to be made on his senses. We remark, that by operating on these impressions the understanding becomes normal, but when it is exercised on recollections it becomes abnormal. In other words, we observe that by impressions on the senses, reasonable ideas are excited, but when ideas are excited by recollection, they are not reasonable. The indication, therefore, is to act, as much as possible, by means of sensible impressions; and as little as possible, by means of recollected ideas. This amounts to a removal of excitation, and a counter-excitation, a real revulsion, physical and moral; still it operates in the encephalic nervous apparatus, too near to the locality excited, and may, therefore, lose his character of revulsion and counter-excitation, and become a direct and hurtful mode of excitation, for endeavoring to divert the patient from his predominant ideas, they may become thus excited even to a state of violence. It is for this reason that we should give preference to muscular exercises, which are calculated to fix the attention of convalescents. Games that exercise the body, and gardening, have been much vaunted for this purpose. Gymnastics ought to occupy a chief place, and every lunatic asylum ought to be provided with the machines invented and brought to perfection by Col. Amoros. We may find in these employments a double revulsion; one which excites a series of ideas of a very different class from

those which connect themselves with that kind of innervation which aids the operations of the intellect, of the memory, and of the imagination; one which directs innervation toward muscular exertion; hence, this last is a revulsion which acts more at a distance from the locality of morbid irritation than any which could be obtained by exciting the senses.

As to discussions tending to prove to the insane that they are in error, we should abstain from them still more than from the bad practice of cherishing their chimera for the purpose of obtaining their good opinion. The first course of conduct irritates them at once; this is the direct irritation of which we have just now spoken: the second practice would finish in the same way, if we were to continue it too long. Our concessions to them should be momentary, and only to lead them to bodily exertion, and to divert the morbid course of their ideas. It is always dangerous to deceive them, for they discover and do not easily forgive it; this discourages them, irritates them, and prevents that calm state of the nerves so necessary to their cure.

All physicians who have contemplated insane people nearly, agree that the first and surest hopes of cure are founded on the return of natural affections. The more the confined patient exclaims against persons formerly dear to him, and the more he misinterprets the cares of his physicians and keepers, the more he complains (*if it be without reason,*) of injustice and bad treatment, the less confidence can we have in the return of his reason. The same conclusion follows if he does not disapprove of his own conduct while insane; for the first movement of reason is to acknowledge his insanity and lament his extravagances, of which he seldom loses the recollection, but on the contrary will relate them in full detail, excepting those parts of his conduct which took place under the greatest degree of agitation, for the reason assigned before in pages 486—265.

From the moment when the patients can no longer sustain a reasonable conversation, when their attention relaxes in listening to you, when they regard you with a silly look, when they fall again into their various chimeras and incoherences, or begin again with certain automatic movements, which they have been accustomed to indulge in, when they interrupt you, and when all this takes place in spite of the efforts which they seem to make to restrain themselves, to

hear, and to comprehend what is said, you may conclude that the memory is enfeebled, that dementia has commenced, and the disease is incurable. But before we decide peremptorily, we must recollect that an inability to think, and the most perfect stupidity may be the result of a temporary congestion. An insane person, therefore, must not be classed with patients under dementia, till he has passed through all the grades of the disorder. But if after he has exhibited proofs of excessive moral irritability, indicated externally by paleness, meagerness and wrinkles, he subsequently loses memory and attention, puts on a calm countenance, fattens and looks fresh, dementia has surely taken place, physical and moral revulsions can do no more than keep him under good nourishment and prevent cerebral congestions. But if beside all this, speech should become difficult, and his walk tottering, general palsy is imminent, and all expectation from any form of revulsion is over. Still more hopeless will the case be, if the patient has had several incomplete apoplexies, if he has been epileptic, if he has lost the use of one of his senses, or any of his muscles.

In such cases we are limited to precautions merely hygienic; to all the means of cleanliness, and the prevention of those accidents to which such persons are subject. For example, an excess of sanguification may expose them to apoplexy, and bleeding or leeching may be necessary to prevent it. We must judge of the necessity of resorting to these means by the color in the face, and an increased torpidity of muscular movement, a greater disposition to somnolency, to stuttering, attended by fulness of the pulse, &c. After a bleeding, the patient seems reanimated, his power of walking returns, and even slight mental attention, this gives rise to hope in persons not accustomed to the disorder, but hope soon vanishes.

It is also possible that a gastro-duodenitis, on engorgement of the liver, or a difficulty of stercoration, may require the application of leeches to the epigastrium, to the hypochondria, or the use of a cathartic, but it will be dangerous to render the call for them habitual.

Accessory disorders do not require peculiarity of treatment among the insane, but it is of prime importance to prevent these complications by guarding against cold, by woollen clothing, by preventing a practice common among them of undressing themselves, by watching over the clean-

liness of their cells, taking care that moisture is not stagnant in them, and by warming their apartments to prevent this during the winter, by chimneys so disposed that the fire is out of their reach.

Sometimes it becomes necessary to feed patients under dementia, by introducing victuals into the mouth to prevent their dying of hunger, and to clean them frequently in the day to get rid of their filth; but beds and chairs may be contrived that will prevent their dirtying themselves.

Sometimes also it is necessary to contrive beds so that the half paralytic patients may not fall out on the floor, and perish with cold, or contract some dangerous disorder.—None of these petty precautions ought to be neglected, for they prevent complications which too often abridge the lives of these unfortunate persons.

SUPPLEMENT.

This work was just finished when the "*History of Philosophy, during the 19th century*," by M. Damiron, appeared, and the "*Lessons*" of M. Cousin were put to press. Although superabundant information is to be found in the "*Treatise on Irritation*" to furnish a reply to what these authors have advanced in favor of a separate principle added to the nervous system, we have thought it right to insist in this supplement on the two important points, which according to them, constitute the vital questions of philosophy: the one is the *argument of Hume*; the other, the *elements of reason*, established by M. Cousin, in his 4th lesson of 8th May, 1818.

Hume asserts that what is actually and substantially settled in a sensible phenomenon does not include the relation of an effect to its cause; that this sensible phenomenon presents to us only an accidental coincidence and connection; hence, according to the Ontological School, it necessarily results, that as the whole human race find this relation of cause and effect in every phenomenon which is

an object of their senses, they can only make this discovery by their mind or understanding. For example, there are two balls on a billiard table, the one in motion, the other at rest ; the first strikes the second, which moves. They pretend that the mere sense of sight cannot give us the idea that the first ball in motion is the cause of the other's moving ; inasmuch as this causality is an induction of reasoning, not an object of sight or of touch. They use the same reasoning as to all the phenomena of nature, which they have deduced from the phenomena of art. Thus, there are alterations of rain and of fair weather, of heat and of cold ; there are earthquakes, hot springs, plants and animals, that present to the observer different functions, &c. We have no sooner seen these phenomena than we are persuaded that each has its separate cause, its design, its means, &c. although neither cause, or design, or means, strikes our senses.

We have proved in page 97 of this work, that these deductions of causality as to the phenomena of nature, are only comparisons suggested by induction of numerous analagous facts. But the question here is, as to induction itself,* which is attempted to be made a phenomenon independent of the nervous system. The reason assigned is, that induction is not a fact of sight, of hearing, of touch, of taste, of smell. Well, gentlemen, who ever said it was? If the inductions you bring forward, and which constitute your reasoning and mine in the present discussion, are not made by the senses, they are made by the brain, as will appear from the development of the nervous system, and the arguments stated in page 97 et seq. of this work. The objection then is reduced to this, *the fact of induction differs from the fact of perceiving a body*. No doubt it does ; for induction is the result, the sequence of perception ; it is manifested after perception and in consequence of perception. But the brain is as necessary in the one case as it is in the other ; all the difference is, that perception occurs more easily and more frequently than induction. It belongs to observation afterwards to make us acquainted with the causes of these differences so far as they can be known.

* Broussais uses *induction* here and afterwards, in the English sense of *deduction*. In English, we deduce, or infer a consequence from the induction of a number of particular instances : this is proof by induction. Broussais means to infer, to *deduce*.—*Trans.*

They say that induction, the equality of two quantities, for instance, as when we say that two on one side are equal to two on the other, is a relation not cognizable by the senses, from which it escapes to the imagination, for it is invisible, and has no concrete existence. No doubt; but if we make the same affirmation concerning a simple perception, we may do it just as easily. The perception of white and black, like round and square, are things neither visible or tangible or concrete; the external body itself which gives rise to these perceptions, and our own bodies and sensible organs which concur in furnishing them, alone possess these qualities. The ontologists agree, that we have ideas of bodies only because we have organs of sense; why then do they not agree that we have induction only because we have a brain? Proof enough of this they may find in this work. They do not acknowledge because they do not see it. They ought therefore to deny that the perception of a color is made by means of the brain, for without a brain the eye can give us no sensation of color. Nor can we see any thing more of the perception of black and white, than we do of the phenomenon of induction. But observations made by the senses on other persons after having made them on ourselves, teach us, that the perception of white, and the induction that it differs from black, are equally operations of the brain. But as we have shewn in the course of this work, the psychologists commit the mistake of judging concerning man by their own internal feeling, instead of giving themselves the trouble of verifying their conclusions by the proof of sensations.

After having inferred from the functions of the nervous system, inaccurately observed, the existence of some stranger principle within this nervous system, the ontological physiologists confide to this principle every thing that their ignorance of the facts that compose the history of man, does not enable them to explain. Having thus separated thought from the nervous system, they personify it; they make it act like a being; they entrust it with certitude, proof, reality; they treat it as if it were all and all in man. Then they imagine another entity with another name, of which thought itself is but the evidence and the expression. Such are the hypothetical metaphors about which they have no dread or hesitation; all that relates to the moral* phe-

* This word includes thought, understanding, volition, affections, passions, &c. not merely morality in the English sense of moral.—*Trans.*

nomena, is treated in conformity to this basis of their system.

We now address them: you are the dupes of intellectual phenomena. You take the word that recalls them to your memory, for the facts themselves which it designates. We have already proved this to you, by the history of the facts and of the instruments that produce them. We shall now furnish another mode of proof. *You say*, it is the soul (l'Esprit) which is not nervous matter, it is this soul that perceives, feels, reasons, foresees, &c. *We say*, it is the nervous system itself that that does all this. *You answer*, how can the nervous system do this? *We reply*, we know not; we do not seek to know; for we have ascertained and acknowledged, that it is impossible to be explained by us. *You*, are astonished at our resignation, and you add, *we know*; it is because the soul is within the nervous matter. Very well, (say we) shew us, then, how it goes to work. You then take up the subject and you make this soul of yours which is not matter, act exactly as a man would do who is matter: that is, you repeat, as if it were an explanation, every thing concerning the human functions, which we are, to the full, as well acquainted with as you are. In truth, whatever trouble you give yourselves to make of the soul acting, something different from the man acting, the identity is perfect. It is a man of imagination that you locate in the brain, as we have shewn in the present work; and you compel this imaginary man of your own creation, who, as you say, has nothing in common with the material man, but who in fact differs only in name—you make this, your man, do from the very beginning every thing which the material man does. I know not whether you perceive this substitution; but to take away the marks of resemblance, you attribute actions to your man which the common material man cannot perform. Sometimes you make him act like an animal, sometimes like a plant, sometimes like some material body inert, or imponderable. When you want some more elevated being, some genius intermediate between God and man, you accumulate on him every thing that seems to you astonishing, or singular, in facts that can or cannot be explained; and full of lively emotion, you prostrate yourself before this prodigy. Words do not suffice to your enthusiasm, for you are heated by the contemplation of your idol, and you give birth in yourselves to a real passion.

Thus you act : and you think you go further than we do ; and that is true. You do go farther in hypothesis, and on the ideal road you travel. If, now, we should disengage from your pompous descriptions of *Being*, every thing which belongs to the bodies we are acquainted with—if we reduce your gratuitous multiplication of qualities to those which admit of proof—it will appear manifestly that you have either asserted nothing of your pretended separate principle different from what is true of the nervous system, and which has not been said of man himself ; or else, what you have asserted beyond this, being unsusceptible of proof, can only be considered as hypothetical and imaginary, if it ought not to be considered as absurd. We may safely conclude that you have advanced nothing certain as to the rationale, the *how* of perception, reasoning, willing ; nor is this *how* (the mode and manner in which they are produced and arise) any more known to you than to us. Let us therefore proceed to the second point proposed to be discussed in this supplement.

M. Cousin attempts to give perfection to the categories of Aristotle and Kant, to establish the elements of reason which is the principle of motion of his philosophy. The perfection thus needed, proves in the outset that in the ontological schools, reason is not necessarily a single phenomenon, observable by the senses, and whereon all the world is agreed, but that it is some factitious entity that varies according to the inclination of philosophers. M. Cousin will object, that his reason is that which his consciousness reveals to him. But we have already proved in this work, that consciousness is nothing but the result of perceptions furnished by the senses, external and internal. We have acquired the right, therefore, of submitting the categories of the French philosopher to the experience of our senses ; that is to say, to enquire whether the perceptions of the senses are in fact the organ of these elements, and how these elements can proceed from such perceptions. We shall be brief, not to swell this volume, especially as we may safely refer to the body of the work.

The elements of M. Cousin are : 1st, IN RELATION TO NUMBER, *unity and multiplicity*. These are ideas resulting from the actions of the senses upon the brain, and the reaction of the brain after the influence of the senses ; and the comparisons made of numbers with each other, are deduc-

tions (*inductions*) which, like all other deductions possible, are also mere facts of cerebral action. The how, the manner in which all this comes to pass must remain unknown.*

2d, IN RELATION TO SPACE: *it is determinate or bounded: or it is indeterminate or absolute.* The idea of space bounded, is a production of sensitive perception. The idea of space unbounded does not exist as a simple idea. We can see in it nothing but an hypothetic deduction attesting our ignorance and our routine.

3d, IN RELATION TO EXISTENCE; *the quality, absolute or relative.* Our senses give us no information of relative existence. Absolute existence is an hypothetical deduction which we cannot discuss without entering into romance.

4th, IN RELATION TO TIME: *it is determinate or it is absolute, which is the same as eternity.* Our idea of time proceeds from the succession of impressions made on our senses, and we compare it always to a line traced in space, that is to say we materialize it in spite of ourselves. As to the rest, not having any sensitive idea of the precise duration of successive impressions which compose what we call time, we cannot speak of it except hypothetically. Hence, when we say, that things have always existed, or will always exist,

* We beg our readers not to forget that the point of difference between the physiologists and spiritualists is placed here and no where else. The following is a summary of our mode of treating this question: we have proved by facts, that all the phenomena, instinctive and intellectual, are acts of irritability of the nervous system, but we have refused any explanation *how* this is brought about—(of the rationale of this hidden process:) we distinguish essentially the fact of the production of thought by means of the brain, from the explanation of this fact; while the spiritualists deduce the impossibility of the fact itself from the impossibility of explaining it; and they place within the brain an entity, a being, for the sole purpose of furnishing this explanation. We reply to them, this being, this entity, is an hypothesis: and here rests the whole question. It is treated at full length in the first part of this work, and all the answers which follow serve but to recall the demonstrations we have already given. 1st, That the opinions of the physiologists is an expression of undeniable facts. 2d, That the opinion of the spiritualists rest upon an hypothesis.—*Auth.*

This reasoning of M. Broussais appears to me conclusive. Life is the conjoint result of the functions performed by the various irritable parts of a vegetable, or of an animal: the word itself is the name we apply to designate the phenomena collectively, of growth, nutrition, assimilation, reproduction, &c. which are the results and consequences of the natural, normal action of the organs whereof a vegetable or an animal is composed. Who can tell the *modus operandi* of these organs? Who can satisfactorily explain how, in what precise manner, these organs act? But is this a reason for denying the reality of what we call life?—*Trans.*

or that they have had a beginning or that they will have an end, we say that which admits of no proof. We speak on two hypotheses; of which the first is founded on our impossibility of conceiving nothing or non-entity, and as we have no example of non-entity, we think fit to deny it. The second hypothesis is founded on this, that we judge of the commencement of the universe from the commencement of some body in this universe, without reflecting that all we see or know consists of transformations of bodies from one form of existence to another.*

5th, IN RELATION TO FORMS; *they are finite, determinate, limited, measurable : but they have a principle which is neither limited, finite, or measurable.* The ideas of form are derived from our sensitive perceptions. That of their principle is a deduction that enters into first causes. The author has said nothing of *colors, of consistencies, of temperatures*; but they are on the same line with forms, although we attribute them to bodies different from those where we think we perceive them. All these words recall perceptions which we receive at the same time with the perception of the bodies themselves which struck our senses; perceptions which we have separated from each other, because the same bodies have moved us in different ways. But if we insulate (separate) these perceptions from the bodies, they are no other than modifications of ourselves; nor can we, without hypothesis, attribute to them an existence different from the bodies in which we perceived them, and different also from our nervous system, the seat of the perceptions.

6th, IN RELATION TO MOTION; *we conceive it bounded, secondary, and relative ; or absolute, and as the first cause.* The idea of action is complex. It embraces a crowd of phenomena, which we comprehend completely or imperfectly as they are distant from, or near to the first cause. But in the preceding categories, we feel a tendency in us to judge of the unknown by the known. It is thus, (that is to say, by hypothetic induction and not otherwise) that we form an idea of the absolute (*l'absolu*) or first cause: nor can we say any thing intelligibly but in consequence of following this process. A wise man, therefore, abstains from all discussion as to the nature of the first cause.

* When we ascribe to a word any meaning other than some matter of fact cognizable by the senses—some object of perception—have we any authority for so doing?—*Trans.*

7th, IN RELATION TO ALL THE PHENOMENA THAT TAKE PLACE WITHIN AND WITHOUT US. *We have ideas of the manifestation or appearance, and of something which is not that ; that something, is the being within us : and thus we distinguish appearance and reality.* This proposition is dreadfully vague. We may well say that our senses do sometimes deceive us as to certain bodies, but we cannot assert generally that the bodies that strike our senses, are nothing but illusory appearances ; for this would make sceptics of ourselves, and deprive us of the right of discussing the question. What do these philosophers mean by a being distinguished from its sensible appearance ? To abstract being from its appearance, is in this case (if we understand it) the same thing as to abstract from matter its powers or its original power. Abstraction here is only applied to existence, instead of being applied to motion and the various changes and forms of matter. Moreover, having been furnished by our senses with no idea of a production *ex nihilo*, we can only speak of it by means of false comparisons ; if the question afterwards should be raised of that which *is*, considered in its production, we can know no more of this than what strikes our senses. Bodies are in a state of perpetual metamorphosis, striking our senses under different and successive forms, and they *exist* as multiform. This is all we know, for this is all the information that our senses communicate. If hereafter we speak of some fixed and permanent being, who pre-exists and presides over all the chargeable and moveable bodies, as we can have no direct knowledge of such a being by means of our senses, we can only conceive of him through a process of comparative deduction ; that is, we have the sentiment only ; we cannot discuss any thing about him, except hypothetically.*

8th, IN RELATION TO THOUGHT, *our reason it is said conceives of relatives in reference to this, to that, and even to*

* Being, abstracted from some distinct individually existing being, cognizable by some or other of my senses, is a non-entity, not a thing, but a word only. Again: I see a rose: it is not in my eye or in my brain. Nothing is certain to me about it when I reflect on this and all the parts of human knowledge connected with the question, but a motion of some kind excited in my brain which I perceive, and designate by the word rose. There are no objects of real and actual knowledge but our perceptions ; their similarities, differences, comparisons, and the results of these are perceptions also—They are motions in the brain perceived ; and when they differ, we recognize them and their differences by the different names we associate with them for that purpose. But the mode of account

what may not exist ; moreover it conceives the principle of thought which passes into all thoughts without stopping in any. Thought, being a mode of action of the brain, its appreciable principle can only be the irritable substance of the brain, put into action by excitements made on our senses, and its inappreciable principle, a first cause. It is metaphorically and by some faulty comparison only, nothing being analagous to thought, that this principle can be abstracted, and made to pass successively through several thoughts.

9th, IN RELATION TO THE MORAL WORLD, we perceive the beautiful and the good ; and we refer to them by an invincible tendency the categories of finite and infinite : that which assumes the form of imperfect and perfect, of ideal beauty and real beauty, of holiness in its unsullied purity. The expressions *moral world*, are figurative. They can only represent human thoughts, that is to say, brains acting in a certain manner by virtue of their irritability, and as we find herein, perceptions proceeding from the viscera as well as from our external senses, these expressions ought to recall the whole nervous apparatus in action under the influence of all the modifiers in nature. So considered, man has perceptions more or less agreeable by the general sensation of pleasure connected with them, more or less favourable to the exercise of his conservative functions, and to those of reproduction and of observation ; more or less proper to satisfy the want he experiences of self-contentment, and still agreeable under the two last classes of relation. The qualities of beautiful and of good, are first ascribed to bodies, then to the perceptions they excite, and at length to a factitious entity substituted in lieu of them. Then comes the habitude of hypothetic comparisons, which tempt men to multiply the qualities which from henceforward they have personified, just as they multiply space and time ; both of these intellectual operations, are really one and the same. Well, it is this hypothetical multiplication, that compels him to find out that what he deemed infinite, is really finite, and what he imagined perfect, to be really imperfect. This it is which gives him abstract ideas of holiness, and of purity unsullied ; for he cannot believe that the cause of those
 ing for these perceptions, by the existence of bodies or things external to us, and which act upon our senses and excite these perceptions, is as much a part of the essential facts belonging to the animal man and his animal frame and constitution, as the perceptions themselves. We cannot if we would, help accounting for them in this manner.— *Trans.*

emotions of respect and veneration, can reside in beings not much his superiors. He resembles a lover who makes a divinity of his mistress, his self-love insinuating that a mere mortal is not capable of inspiring such a passion. But the ontologist goes farther, for he forms beings of all sorts, with qualities incorporeal, hypothetically multiplied ad infinitum, solely from the vivid excitement of his nervous system.

Such also is the origin of the moral ideas opposed to the class already mentioned. I mean those of ugliness, wickedness, impurity, profanity. They are at first suggested by the painful sensations he perceives during the exercise of his functions, and by the obstacles he finds to their accomplishment. Like the foregoing, they ought to represent nothing but perceptions in connection with the bodies that produced them ; but when personified by some first hypothesis, man multiplies them by a second as he has done with the foregoing class, and he arrives at extreme ugliness, horrible, abominable, execrable, until the excess of his internal emotion is such, that he can find no corresponding expression. But it is to be noted that the sorrowful emotions multiply themselves far more than the agreeable ; and these last by their excess, convert themselves into sorrows, when they do not occasion the loss of all sentiment. Nature enforces obedience by pleasure and by sorrow, but of these two ministers of her commands, the last is incomparably the most powerful and the most occupied. This is the reason that religious sects in their promises for the future, have been so lavish of torments for criminals, and so sparing of enjoyments for the good.

We find in these physiological considerations, the explanation of the violence of fanatics, and the atrocious refinements of punishment invented for regicide and sacrilege.—In truth, the more men accustom themselves to hypothesis, the more exaltation do they experience in all their interior emotions : a first hypothetical multiplication of the qualities they attribute to the creature of their imagination, produced, a twentieth, a hundredth, and the emotions increase in the same proportion, for they are the causes of this hypothetical multiplication. But as agreeable emotions are much more limited in extent and duration than sorrowful ones, the passions founded on sorrow and upon anger, are raised higher than those of a joyful and happy character. After indulging during a short period of youth in the pleasures of love,

and we all know how far hypothesis contributes her share in this respect ; after having indulged in the pleasures of the table ; in the pleasures arising from a search after novelty ; in the pleasures of self-love, &c. a man feels new desires arise within him. He has not lost his relish for former enjoyments, but they do not fill up every instant of his time, for the illusions that prolonged the pleasures of love, of the table, of objects and sights of novelty, and the petty successes by which his vanity was flattered, are all necessarily dissipated by the inevitable effect of repetition. A remainder of activity there will be, to be employed, and it may take one or some of several directions. If unfortunately it be directed toward hypothetical investigations concerning first causes, a man will arrive almost of necessity, at intolerance, and even fanaticism and ferocity. He is led on to this by the contradictions to which he is exposed from those who think differently from himself on the same subjects. He arrives at this also, in defence of Kings and Governments, as well as of Gods : for this is the result of the same original abstraction, the same hypothetical multiplication which governs the metamorphoses of all his complex ideas. Here is the first step taken, but when once the emotions connected with wounded self-love, and the anger that reacts in consequence of them, are strongly developed among the principal men of a nation, by the influence of multiplied hypotheses, these emotions transmit and propagate themselves among the mass of the people by the laws of imitation, and thus it is that ferocity becomes a popular feeling. The history of all nations, of whom even the most gentle have at least sacrificed human victims to their Gods, furnish proofs in superabundance.— We have even now under our eyes other proofs of the same kind, which it is useless to cite. We shall only add that the hateful and cruel passions are always in direct proportion to the irritability of the nervous system and by consequence of the encephalon ; we see the cause of this sufficiently ; and it is the same that explains to us why it is that the inhabitants of the south have always shewn themselves more ferocious and more fanatical than those of the north.

To fulfil definitively the object which we proposed to ourselves in this supplement, we shall infer from all the facts and all the reasonings presented in this work, 1st, that the explanations of the psychologists are romances which offer to us nothing new : 2dly, that they have no means of giving

to us the explanations they promise : 3rdly, that they are the dupes of words which they employ for the purpose of discussing things that are incomprehensible : 4thly, that the physiologists are the only class who are able to speak authoritatively concerning the origin of human ideas and human knowledge : 5thly, that men who are strangers to the science of animal organization, ought to confine themselves to the study of the instinctive and intellectual phenomena, in connection with the customs and manners of social life in all its different varieties.

Moreover this subject is quite extensive enough to occupy the whole life of a studious man, and interesting enough to inspire him with enthusiasm. One may write the history of philosophy as one may write the history of mankind, without presupposing any thing as to the manner how the human faculties which we must bring upon the scene, have been developed. All the abstract signs of language may be employed as formulæ recalling certain scenes of life, and certain modifications of thought, without our being compelled to personify these signs intentionally. A man may develop very extensive views of relation, embrace a vast collection of facts, display a plan magnificently conceived, and communicate solid instruction to his auditors or his readers, without maintaining any a priori hypothesis concerning human knowledge. The high interests, the powerful motives, the attractive images, will not be wanting in consequence of the want of such an hypothesis. Nor will any thing be lost on the score of elevation of sentiment ; for on the one hand the respect for the Supreme Being will not be weakened ; divinity gains nothing by being cloathed in the attributes of humanity ; on the contrary, it must appear to be degraded by such a travestie in the eyes of every real philosopher, and sooner or later the people will inevitably discover the artifice. On the other hands there are in man, motives sufficiently powerful to lead him to what is good, just and sublime, and these motives are real, while those with which he is supplied by certain theological philosophers, will fall some day or other into discredit because they are in fact, not real, but hypothetical. The question here is not as to personal interest duly calculated, nor of pleasure, as a motive to our actions, but of something more true and more worthy the part we are assigned to fill in this universe. All the principles of benevolence, charity, devotedness, and

of heroism the most sublime, are to be found in that instinct of affection which impels us toward our fellow creatures—in the necessity for our own self-esteem---and in that most delightful of all pleasures which we experience when we feel that we confer happiness on others. These principles are within us ; they are independent of all opinion which we may have learned or deduced as to the first cause ; they belong to us as the result of the organization of our cerebral nervous system, and they are developed with it ; but they are found also side by side with motives that incite us to actions that are blameable. Hence then, in lieu of constructing hypotheses as to their first cause, or of personifying instincts, an artifice which bad men discover and employ to justify their misdeeds, let us attach ourselves to the development of the germs of public and private happiness, by a system of education founded on justice, on probity, on greatness of soul, on devotion to the happiness of mankind and the good of society ; in a word let us cherish the habit of doing good ; in this there is no deception, no hypothesis, no sophism, that a bad man can pervert in favour of his own bad tendencies.

Paris, 17th May, 1828.

FINIS.

APPENDIX.

BY

THOMAS COOPER, M. D.

PREFACE.

ONE main intention of Dr. Broussais in the preceding treatise, is to rescue the theory of Insanity from the supposition that it is an affection of the mind or soul ; an entity hypothetically assumed, to account for the intellectual phenomena exhibited by the nervous system of the human body ; whether in the exercise of its natural normal functions while in health, or in their aberrations from a natural, normal state, when that system is acting under morbid irritation. Insanity, according to Broussais, is a disease not of the mind, but of the body ; and its seat is in the encephalon. Hence it became necessary for him to shew the total want of reasonable evidence attending the hypothesis of a soul, separate and distinct in its existence from the body, though by some means and in some manner supposed to be united with it, so as to produce by that conjunction, the intellectual phenomena, which constitutes the science of Idiology. The following tracts pursuing the same general train of reasoning, and having the same object, were written and published by me several years before the appearance of Broussais' work, and are here subjoined in confirmation of the physiological opinions he has adopted. This is not a mere metaphysical discussion ; it is far more important to physiology, and the theory and practice of medicine, than to metaphysics.

In the year 1787, (44 years ago,) I published in England the first volume of TRACTS, ETHICAL, THEOLOGICAL AND POLITICAL ; Warrington printed. Among these tracts was one containing a view and defence of the doctrine of Materialism, first read at the Manchester Literary and Philosophical Society ; the same in all essential respects with that here presented, and which last, is in fact, abridged from my early publication. The edition of those TRACTS was well received, and soon sold off ; but owing to other avocations, I never re-published or continued them.

In the year 1822, a clamour was raised in this State, (South Carolina,) among some well meaning but not well informed

people, against the heterodox opinions which it was supposed I entertained; as if it were not allowable in republican America, for any man to entertain any opinions which on due consideration he conscientiously believed to be well founded. This vague and general accusation preferred to the Legislature by two Grand Juries from a distant part of the State, instigated by some of the Clergy, was referred to a Committee of the House of Representatives, who reported in substance, that whatever opinions I was presumed to entertain now, were known before I was appointed to the Presidency of the College, and being deduced from the Christian Scriptures, ought to form no objection to me at this time. The report was adopted and the Committee discharged.

In the recklessness of accusation at that time, it was asserted in some of the newspapers of this State, that Mr. Jefferson had been compelled to procure my dismissal from the honorable situation to which I had been appointed in the Virginia University, (the joint professorships of Chemistry and Law.) It became proper for me, therefore, to be prepared to shew, if necessary, that my opinions on the subject alluded to, were neither inconsistent with the Christian doctrines of the New Testament, or with sound philosophy. In the year 1823, I drew up the tracts here published, and sent them to Philadelphia, as the place most likely to afford their confirmation or confutation; and I published them anonymously, that they might stand or fall by the intrinsic merit or demerit of the arguments employed.

I adopted this course also, from a disinclination to publish any thing of a theological character in this State. I have from the time I came here, to the present moment, conscientiously abstained from the expression of any theological opinion whatever, before or in the presence of any student of this College: my deliberate advice and direction having always been, and now is, that they ought to adopt and profess the religious creed of their parents, till the laws of the land shall set them free from parental control. It will be time enough then for them to investigate these subjects, if they shall be inclined to do so. Young as they are, and while students, they have not the preliminary requisites to do so fully, finally, and beneficially. For this reason, I shall send the present translation of Broussais to a distance, nor shall I publish it in South Carolina.

I cannot help thinking it a great disgrace to the country, that any objection should be made to the publication and free discussion of any opinion whatever; for I know of no means of settling truth on a firm basis, but the perfect freedom allowed to every body of presenting to the public every view that can be taken of a controverted doctrine.— Surely we cannot see the clearer for allowing one of our eyes to be closed, or be the wiser for looking at one side only of a disputed question and obstinately refusing to consider any other. When the gentlemen of the clerical profession shew such morbid irritability at the discussion of metaphysical or theological doctrines which they would fain persuade us are too sacred to be disputed, they give rise by so doing, to the strong suspicion, that they themselves are not fully persuaded, that the doctrines they inculcate are clear of all doubt, and liable to no overthrow. Else why this irritation when some orthodox tenet is modestly doubted? Why not confute their opponents instead of abusing them, and exhibit to the world their own superiority by the mildness and calmness of their conduct and manner, and the temperate force of their arguments?

But I fear this is not to be expected from men who regard a doubt of their doctrines as an attack upon themselves. A Priesthood, claiming to be a separate and a sacred order of men, *hired and paid* to teach and to preach certain doctrines and opinions, and adopting this mode of life as a trade—a profession—as the sure road to comfort and consideration, if not to affluence, and strictly imbued with the *esprit de corps*, the corporation spirit of the clerical order, cannot be expected to come into the field of argument, without a strong bias in favour of the tenets by which they obtain their living, or without irritation and anger against those who in any manner oppose their influence over the people. If truth interferes with their interest, they can hardly be expected to look at it but with a jealous eye. This will happen even to wise, learned, and well disposed men, as many of them really are, when thus placed and situated: and the objection lays, not against the individual, but the order to which he belongs, and the trade by which he gets his living; often forced upon him by circumstances over which he has had little or no control.

Hence has arisen the mischievous interference of the Clergy in Astronomy, Geology, Zoology, Physiology, and

Medicine ; and the check constantly pressing upon the friends of truth, who would willingly discuss all the questions connected with these branches of knowledge, fully, freely, and fairly. Bigotry is a continual spy upon science, and restrains that perfect freedom of discussion which the cause of truth and the good of the public absolutely requires upon every contested question.

As to the doctrine of MATERIALISM, I run no risk in prophesying that twenty years hence, it will be the prevailing doctrine among Physiologists and Physicians, not only in Europe but in this country. The views of the question taken by Priestley, Cabanis, Gall, Lawrence, and Broussais, I consider as pregnant with arguments impossible to be confuted : if they can be successfully opposed, it is high time the attempt should be made by the advocates of ancient opinions. Men of science begin now to revolt at the fetters which their clerical guides would willingly fix upon them ; and something more is required by public opinion, than outcries of heterodoxy and infidelity, and dread lest the enormous influence of the clergy should be exposed to danger. By whatever opprobrious terms truth may be designated, those gentlemen may rely on it, that error is no longer sacred, and if they wish to preserve a reasonable influence among men of sense, they must resort more to argument and less to abuse.

Being in the habit of transmitting to Mr. Jefferson my publications, I sent him the two tracts that follow : and I think my readers will not be displeased to peruse his opinion respecting them which I have accordingly subjoined.

T. C.

THE
SCRIPTURE DOCTRINE
OF
MATERIALISM.

BY THOMAS COOPER, M. D.

PRINTED AND SOLD BY A. SMALL,
PHILADELPHIA.
1823.

PREFACE.

THERE are two doctrines of a religious nature, that seem to have a direct bearing on the welfare of society ; because they are deemed to furnish a sanction and incitement to moral conduct.

The belief in an all-wise, good, and powerful Being, who superintends the moral government of the universe ; and the belief in a state of future existence after the death of the body, wherein every human creature shall be punished or rewarded according to his good or bad conduct and habits, during the present life.

Whether man will be punished or rewarded by means of a *soul*, or as in this life by means of his living *body*, seems to me to be a point of no practical consequence. The sanction—the incitement, consists in his persuasion of the reality of the punishment and of the reward ; whether it be by the one means, or by the other.—Accordingly, there are good and wise men in abundance—pious and learned christians, who are of the one opinion and of the other : nor ought any good man to believe that his neighbour is the worse for adopting either.

Circumstances, unnecessary to be detailed, have induced me to draw up my own opinions on the subject, and the arguments on which I rely to prove that Christ and his Apostles were Materialists, a point about which I entertain no doubt ; but the reader will judge for himself ; I have no right to judge for him, or he for me.

A BRIEF ACCOUNT OF THE
SCRIPTURE DOCTRINE OF
M A T E R I A L I S M .

Two opinions are entertained respecting thought, intelligence, and the phenomena termed mental, or intellectual. *One* is, that they are to be ascribed to a being distinct from the body, having no property in common with matter (immaterial, spiritual,) incapable of corruption like the matter of our bodies, and in consequence thereof, immortal. This being, naturally distinct from the body, is the human *soul*; united to the body during its life, set free from the body at death, and without whose union with the body, there would be nothing like thought, volition, or action. As the soul alone can act and suffer, this opinion of its separate existence has been considered as essentially connected with the christian doctrine of a future state. Such is the prevailing opinion adopted by almost all the clergy; and by them inculcated as an article of faith, essential to Christianity.

The *other* opinion is, that all the phenomena termed mental or intellectual, are to be ascribed, not to any soul, distinct or separate from the body, but to the properties which God Almighty has been pleased to connect with the human frame—with the human system of organised matter. So that thought, volition, action, are the results of the circumstances to which God has been pleased that man, as an organised being, should be exposed, during his continuance in this life. It is also said, that there are manifest appearances of thought, volition, and, consequently action, in brute animals; inferior greatly in complication and perfection to those that are observed in man, but not different in kind. The organization of brute animals being in many essential respects inferior to that of man.

According to the first doctrine, man is a compound animal consisting of a soul immaterial, immortal, invisible, and of a body such as we see: This is *Immaterialism*. According to the second doctrine, man is not a compound animal, but consists merely of the parts and their properties, which are visible and apparent, and which can be made known to us by our senses: This is *Materialism*. According to the first doctrine, when the body dies the soul survives; according to the second doctrine, when the body dies, the whole man dies.

The present inquiry is, which of these two doctrines is most conformable to Christianity, as delivered to us in the four Gospels that furnish the details of the life, death, and precepts of Jesus Christ. If it shall appear on the balance of evidence, that Jesus Christ supported in precept and in practice, the one opinion or the other, then is it a christian duty to embrace that opinion which has received his sanction.

I propose to shew, that the opinion denominated *Materialism* is—and that the opinion denominated *Immaterialism*, is not consistent with christianity.

It will be prudent at the outset to settle the question—

WHAT IS CHRISTIANITY?

The christianity of the Romish church, is one thing: of the Greek church, another. The christianity of an Athanasian, of a Sabellian, of an Arian, of a Socinian, of a Priestleyan, are all different: the variances relate to essential points. The christianity of Calvin and the synod of Dort, was one thing: the christianity of James Harmens (Arminius) was another. The christianity of George Whitfield, like the thirty-nine articles of the church of England, admits the doctrine of election and reprobation; and Whitfield held the final perseverance of the saints. The christianity of John Wesley, and of the present church of England, from the bench and in the pulpit, excludes both the one and the other. The opinion of a Trinitarian appears to an Unitarian to be Polytheism and idolatry. The opinion of an Unitarian seems to a Trinitarian, little, if any thing, short of blasphemy.

To a rigid Calvinist, mere morality, and the slightest value or efficacy allowed to good works, is setting up the works of the law over the precepts of the Gospel, and the pretensions of good conduct and benevolent actions over faith in Christ, and redeeming grace. To a Calvinist, all good works proceeding merely from the voluntary disposition, the kind affections, the due regard for character, and sense of social duty in a person not yet called through grace, and justified in Jesus, “doubtless (in the language of the thirty-nine articles) have in them the nature of sin.” While to a man who professes to be governed in his conduct by a sense of moral rectitude, of obedience to the laws, and respect for his own standing in society among the good and the wise with whom he lives, the Calvinistic decision of the quinquarticular controversy, or the five points, as they are called—the doctrine of final perseverance, election and reprobation, independent of moral conduct—and the efficacy of a death-bed repentance—assume the character of temptations and provocatives to all manner of crime, and are subversive (where they really operate) of all the bonds of civil and domestic society. That a life of crime may be fully expiated by a few minutes of repentance, may be Calvin’s religion, but it is not a tenet that society ought to encourage.

Amid these dissonances of opinion, where are the genuine doctrines of Christianity to be found? In the Bible? Alas! all sects and all parties appeal indiscriminately to the Bible. Each constitutes himself sole authorised interpreter for, and infallible judge of his neighbor; and sets up the paling of exclusive salvation within the narrow limits of his own creed. I have searched so much, so long, so ardently, so anxiously, to arrive at *truth* on these subjects, that I am sensibly alive to all the difficulties that surround it; to the dangers of discussing it; and the certain punishment that awaits every man, who opposes predominant opinions. Hence, I do not pretend that my opinions are true: I can only say that I believe they are. Hence, I have full charity for all seekers after truth who differ from me in opinion. Let them hold their opinions; they have as much a right to them as I have to mine: their belief is as obligatory on them, as mine on me. But I hope I ask not too much, if I require, that the toleration shall be mutual. Whatever my own opinions may be, they have been the result of laborious inquiry—they have never conduced to my interest, but far otherwise—I have never taken them up as a trade—I have no motive of interest to adopt or avow them—I do not get my living by professing them. In saying this, I blame not those who do, but it manifestly furnishes a drawback from their authority. It renders them biassed and incompetent witnesses, according to the rules of every court of justice in every civilized community. Hence I object to the interference, and much more to the decision of men, who being hired and paid to propagate certain opinions, will of course maintain the doctrines by which they live and thrive. The motto of a hired and paid priesthood, is in all ages and in all countries the same: "Great is Diana of the Ephesians;" and the worldly-minded among them will hoot out of society, if they can, all those who interfere with their trade. I know *many* worthy men of the clerical order, to whom this will not apply; men whose sound learning, good sense, and kind dispositions make them estimable exceptions to a general rule. But the general rule is as I have stated it; and my reader knows it is so. If I state this strongly, it is because I have felt it deeply. Suppose an architect, a painter, a physician, called upon in a court of justice to give his professional opinion upon a professional point in litigation: suppose it should appear on the cross-examination, that he was hired and paid for giving currency to the opinions he had advanced before the court—would the jury believe him? would the court allow any weight to his testimony? But the clergy consider this objection almost as blasphemy: for they have always, and every where, arrogated exclusive privileges that their fellow-citizens dare not claim. In answering the question "what is christianity?" I presume not, therefore, to do more than submit to the reader my own opinion, with the reasons on which it is founded; leaving him to judge of the one and of

the other. Requesting only, that until he can discover a probable and reasonable motive why I, a layman, should embrace opinions so unpopular, unless it be the truth of them according to the lights I possess, he will impute to me error of the understanding only; and to this I shall willingly submit. It is with great reluctance I engage in this controversy, but the events of my neighborhood have rendered it a measure of defence.

I lay it down as a known and acknowledged rule of evidence, that in ascertaining any fact, we are to require and resort to the highest and best evidence that the nature of the case will admit. We are not allowed to proceed upon hearsay testimony, where the original witness can be produced;—we must not produce a copy of a deed, when the deed itself is at our command;—we must not aver against a record;—we must not bring the fleeting recollection of verbal assertion, in opposition to declarations deliberately written and acknowledged;—and so on.

I lay down also as known and acknowledged rules of evidence: That we cannot contradict or modify superior evidence by inferior: if the testimony of B depend upon the evidence of A, it can neither add to nor detract from the value of A's evidence.

That we need not resort to inferior evidence, if the superior be adequate to our purposes.

That we are to rest our fact and all our conclusions from it on the *best* evidence that can be produced to establish it, and no other.

That if the evidence thus admitted be clear in the main, and ambiguous in some parts, we are to construe the parts that seem ambiguous, in conformity with the main object and intention about which there is no ambiguity.

Lastly, That Christianity being intended for all mankind, must necessarily consist of few propositions, and those plain and intelligible to any man of common learning and common understanding.

And now to the application.

Christianity is to be found in the doctrines and facts promulgated in the New Testament.

The New Testament consists of the doctrines and facts of Christ's ministry contained in the four Gospels; and of the doctrines and facts related of the apostles, after his resurrection.

The doctrines and facts relating to Christ himself, as delivered to us by the four evangelists, are the highest and best evidence we possess of what Christianity is.

1. Because Jesus Christ was the founder of Christianity. It rests upon what he said and did.

2. Because all Christians acknowledge that Jesus Christ could not be deceived. He was not fallible like common men.

3. Because his apostles, deriving all their knowledge from him, can neither add to, or diminish the authority of his doctrines.

Hence, I hold that no comments, apostolic or other, upon the doctrines of Jesus; are in themselves obligatory on his disciples.

I rest exclusively on the *best* evidence the nature of the case will admit,—on what *Jesus Christ* said and did;—and I seek for Christianity in the four evangelists, and in them only. A Christian is bound by all the precepts and doctrines of Christ Jesus: he acknowledges no other master and needs no other teacher.

The reader is acquainted with the four Gospels of the evangelists; appealing then to the reader, I say, that the only doctrines of Christianity plainly and clearly delivered by Christ himself, and which his apostles were enjoined on to propagate, are these:

1. The doctrine of one God; God the father, as the only object of adoration, and as the only creator, preserver, and moral governor of the universe; in opposition to the absurd notions of polytheism prevalent all over the world when Christ appeared.

2. The resurrection from the dead, and a state of future rewards and punishments distributed according to the past conduct, habits and dispositions of the dead person, who shall for this purpose be called up before the judgment seat at the great day.

This doctrine is rendered necessary to complete the plan of the moral government of the universe; and to rectify the apparent inequalities of good and evil in the present life by the distributive justice of a future state of existence. This doctrine was not prevalent among the learned of the heathen world; and it renders Christianity of unspeakable value to a Christian, because it puts a doctrine of the very highest importance and of the most salutary influence upon Christian foundations, resting upon evidence nowhere to be found but in the Christian scriptures.

3. That Jesus was a person sent of God, divinely commissioned to teach these most salutary doctrines, to confirm them by miracles while living, and by his own predicted resurrection after death: and he did so.

Thus far all sects and orders of Christians agree: and I defy the reader to shew me any other opinion delivered in the four Gospels, in which Christians do so agree. Surely those doctrines, which large portions of good, and wise, and pious, and learned men differ about, after eighteen centuries of laborious discussion, may well be considered as dubious. Do they agree in the nature and character of Christ himself, whether he was equal with the father or inferior,—co-eternal, or of subsequent production? Are the doctrines of transubstantiation, of the immaculate conception, of original sin, of election and reprobation, of vicarious suffering, clearly and explicitly taught in language plain and free from the figurative ambiguity of eastern metaphor? Are any of the five points so laboriously and abstrusely handled at the synod of Dort, clearly and explicitly laid down in the holy Gospels? No! they are not. It is notorious, that they are at this day, as in former days, disputed in every part of Christendom, by learned and grave men. As I consider the christian dispensation intended for the benefit of no part of mankind exclusively, but introduced for the present and

eternal welfare of the poor, the meek, the unlettered, at least as much as for the learned and the wise—I cannot consider any doctrine essential to Christianity, that is not clear and intelligible to an unlearned man of common understanding. Hence, I throw out of the catalogue of Christian doctrines all those abstruse points that occupy the pens of learned theologians of the present day. What! shall a doctrine be deemed essential, that has been a subject of controversy for near two thousand years and not yet settled? What! shall a doctrine be deemed essential, which none but learned men are capable of discussing? God forbid. Jesus Christ loved little children, he comforted the poor in spirit and the broken hearted, he honored the widow's mite: Would he mock his followers with doctrines too abstruse for the comprehension of the great mass of mankind,—of the very class he was accustomed to address?

Moreover I consider no tenet as essential, that does not bear directly on our moral conduct; that does not make us better men; that does not furnish a motive and a sanction to abstain from evil and do good; that does not tend to make each member of society more valuable to each other. The doctrines of one Supreme God, the moral governor of the universe and a state of future rewards and punishments in another life according to our conduct and acquired habits in the present, have manifestly this good tendency. To Christians, there is no sufficient evidence of a future state, out of the Christian Scriptures, and independent of Jesus Christ, who brought life and immortality to light. The Christian therefore rests upon the Gospel facts with peculiar satisfaction. But what direct bearing on morality can we find in such questions—as whether the three persons in the Trinity be three separate persons, distinct intelligent agents, or three modes wherein the Supreme Being exhibits his power and character;—whether the generation of the son be eternal or not;—whether the holy ghost be a person or an attribute;—whether the holy ghost proceeded from the father only or from the father and the son;—whether the son be *omoousion* or *omoiousion* (of the same or of similar substance) with the father;—whether all mankind deserve to be consigned to eternal torments because Eve tempted Adam to eat the forbidden fruit;—whether we are to bear the pains and penalties of our own misconduct, or whether Christ bore them for us;*—whether the terms of redemption are availing for the benefit of all men, or for

* Dr. Magee, of Trinity College, Dublin, has published a thick octavo in defence of the orthodox doctrine of vicarious suffering and atonement, crowded with learned references and quotations. If such a book be necessary to prove the doctrine, then the Scriptures are insufficient for the purpose, and the doctrine is not worth the pains taken with it. Besides, can a doctrine be essential, which after near two thousand years of discussion, requires at this day learned volumes to establish it? The modern

the benefit of the elect only;—whether the elect were chosen because God foreknew how they would act, or whether their actions are guided and determined by God's predetermination;—whether, in the quaint phraseology of Gale, God predetermined man's volition or gave only his "predeterminate concurrence to the entitative act?"—whether a saint may fall from grace not only foully but finally;—whether good actions, performed before a sinner be called through saving grace to repentance, have in them the nature of sin, &c. &c. I ask, is the *great cause of morality* furthered by these questions?

I acknowledge therefore no disputations or disputable Christianity. I know nothing beyond the points I have mentioned as essential to the belief of a Christian. I see that all sects acknowledge these doctrines so far as they are here laid down; and as I know of no other theological opinion undisputed among Christians, I adhere to these and these only.

If then it be asked, is Christ equal with God, or coeval with God, or inferior to him in power, was his generation from eternity or in time; is he an object of adoration equally with the father; is he *omoousion* or *omoiousion*? I cannot tell: none of these points seem to be settled by an uniform series of plain and unconflicting texts that leave no room for hesitation. I content myself therefore with what is plain, clear and indisputable. Jesus Christ was divinely commissioned for the duties he fulfilled on earth, or he could not have worked miracles in proof of his doctrine. I understand thus far; and there I stop. Well, but the resurrection from the dead: this is not so plain as to be free from doubts and difficulties even to a materialist. What kind of a body is it that will rise? The corrupted and corruptible mass of matter thrown into the grave? or some body more fit for the enjoyment of immortality? To all this I reply, that Jesus Christ having preached the resurrection of the body, I take it *as he preached it*. If I cannot explain all the difficulties that attend this opinion and resolve all the curious questions that can be raised on it, I am content. A Christian is content to believe Jesus Christ on his own terms, and after his own fashion, and no other. Had all these curious questions required explanation, he would have given it: if he has not given it, we need it not. Such is my notion of Christianity. If I think that others believe too much, and if they think that I believe too little, I cannot help it. By the use we have made of the lights that have been afforded us, must we stand or fall; and may God

doctrine of atonement and vicarious suffering succeeded after and in place of the Roman Catholic doctrine of indulgencies.

Moreover, no doctrine can be essential, of which the clergy would prohibit the discussion; nor is it likely that an opinion is well founded, when they denounce those who controvert it. Like other men, they are timid whenever their cause is weak; and when they want to scare away discussion, it is a sure sign that they dread it.

forgive, as I hope and believe he will, the involuntary errors, on the one side and the other, of those who seek after truth.

I shall now attempt to shew, that

THE SCRIPTURE DOCTRINE OF THE RESURRECTION, IS WHAT IS NOW CALLED MATERIALISM: AND THAT IT IS INCONSISTENT WITH THE NOTION OF A SEPARATE, IMMATERIAL, AND IMMORTAL SOUL.

The plainest account of the resurrection seems to be that delivered by Jesus Christ in the 5th chap. of *John*, 24, &c. "Verily, verily I say unto you, he that heareth my word and believeth on him that sent me, hath everlasting life, and shall not come into condemnation, but is passed from death unto life. Verily, verily I say unto you, that the hour is coming and now is, when the *dead* shall hear the voice of the son of God, and they that hear shall live. For as the father hath life in himself, so has he given to the son to have life in himself; and hath given him authority to execute judgment also, because he is the son of man. Marvel not at this, for the hour cometh in the which *all that are in the graves* shall hear his voice, and come forth; they that have done good to the resurrection of life, and they that have done evil to the resurrection of damnation" (condemnation.)

The resurrection of the Gospels, whether of Christ or others, is always spoken of as a resurrection of the dead *Luke* xxiv. 46. "Thus it behoved Christ to suffer and to rise from the dead on the third day," *John* xx. 9. That he must rise from the dead; and so on. I need not multiply passages on this point, which cannot be disputed.

But on the modern hypothesis of an immaterial soul, that survives the body and never dies—which is to be the future object of reward and punishment—the *resurrection of the dead* is not merely an absurdity, but a falsehood.

Again, if this supposed seat of thought, intelligence, volition, of all the passions and affections, do really exist, as is supposed, then is a resurrection useless and unnecessary. That being needs not be revived from the dead, which never dies.

An immaterialist—a deist, needs not this manifestation of divine justice first revealed by Jesus Christ. Our body (they may say) is the passive instrument of the soul which is confined to it during this life; it is meant to serve the purposes of this life only: when the body dies, then is our nobler and most essential part set at liberty; and exerts its powers, free and untrammelled by the fleshy load to which it was conjoined. As it is of itself, and essentially immaterial and immortal, no future resurrection is necessary to its future existence.

These are the fair and inevitable conclusions from what it pleases the priesthood to call orthodoxy.

Again: If it were true that the human being consisted of a material body incapable of thought, volition, feeling, intelligence—

and of an immaterial and immortal soul conjoined to it during life, and set free from it at death—and if this were one of the essential doctrines of the Christian religion, then would the declarations of Jesus Christ to this purpose, have been plain, unambiguous, and explicit: but we have no such description of human nature laid down by Christ; he has no where adopted or declared this opinion; he has no where described us as consisting of an immortal soul conjoined to a mortal body, or inculcated any thing like it is an article of faith; he has uniformly declared, that the resurrection he preached, was the resurrection, not of the compound creature man, consisting of body and soul—not of the human soul which is described as immortal—but of the *human body*, which died and was buried. I hope the expressions of Jesus Christ will be accepted as good authority for what is Christianity on this point; I have no better to offer.

I repeat, that when Jesus Christ talks of the resurrection of the dead, it must be the resurrection of that which is liable to death; and it cannot mean the resurrection of that which is not liable to death, but being immortal, never dies. *Matt. xxii. 23. Mark xii. 18. Luke xx. 33.* The Sadducees put to him a question of matrimony under the Jewish law; they asked, “therefore, in the resurrection, whose wife shall she be of the seven.” Here was a fair opportunity for Jesus Christ to have explained the modern doctrine of immaterialism, and to have shewn that the institution of marriage was a corporeal rite, and had reference to the body only, and that the marriage of two immaterial souls, was an absurdity and an impossibility. But he gives no hint whatever of the soul; only that, at the *resurrection of the dead*, there is neither marrying or giving in marriage.

Luke xxiv. 46. And he said unto them, thus it is written, and thus it behoved Christ to suffer, and to *rise from the dead* on the third day.

John xx. 9. For as yet they knew not the Scriptures, that he must rise again from *the dead*.

John ii. 21. But he spake of the temple of his *body*.

When Jesus had risen, the women who went to search for his body, found it not in the sepulchre; for the *body* had risen from the dead. *Luke xxiv. 6.* Why seek ye the living among the dead? He is not here, but is risen.

When Christ died upon the cross, many *bodies* of saints that slept, arose. *Matt. xxvii. 52.* Is it not strange, that in none of these passages relating to the resurrection from the dead, have we *any* reference to the soul?

Again: The resurrection from the dead promised by Jesus, was exemplified by his own death, burial, and resurrection, such as was *his* resurrection, such will be *ours*; or he died to no purpose. If *his* personal exemplification of the resurrection from the dead, to which he appealed, was different in its kind and nature,

from that which mankind are to undergo, it becomes no longer a type, an exemplification, and a proof of *our* resurrection. He arose expressly, after predicting that he would do so, to make manifest and illustrate by fact, the doctrine he had been preaching. Let us then consider the Scripture account of Christ's own resurrection.

John xx. 24. But Thomas, (one of the twelve,) called Didymus, was not with them when Jesus came. The other disciples said unto him, we have seen the Lord : but he said unto them, except I shall see in his hands the print of the nails, and put my fingers into the print of the nails, and thrust my hand into his side, I will not believe. And after eight days again, the disciples were within, and Thomas with them. Then came Jesus, the doors being shut, and stood in the midst, and said, peace be unto you. Then saith he to Thomas, reach hither thy finger and behold my hands ; and reach hither thy hand and thrust it into my side ; and be not faithless, but believing. And Thomas answered and saith unto him, my Lord and my God ! Jesus saith unto him, Thomas, because thou hast seen me, thou hast believed ; blessed are they who have not seen me, and yet have believed.

Other circumstances are mentioned by *Luke* xxiv. 38. in giving an account of Jesus appearing to his disciples after his resurrection. " And he said unto them, why are ye troubled, and why do thoughts arise in your hearts. Behold my hands and my feet, that it is I, myself : Handle me and see ; for a spirit hath not flesh and bones, as ye see me have. And when he had thus spoken, he shewed them his hands and his feet. And while they believed not for joy, but wondered, he said unto them, have ye here any meat ? And they gave him a piece of broiled fish and a honeycomb, and he took it, and did eat before them." See the parallel passages, *Matt.* xxviii. *Mark* xvi. *Luke* xxiv. 39.

This is the only account the Scriptures give us of the great and important proof, and manifestation of the resurrection of the dead, produced by Christ himself, as an example of that future miraculous destination of the human kind.

If the belief in the separate existence of a soul, which dies not with the body, and its liability to reward and punishment at the great day, be an article of Christianity, was not this the proper, the last, the only occasion to explain it ?

Is there one word of the human soul in this account ?

And when Christ appeals to his disciples, and describes what constitutes himself ; does he not appeal to his visible, tangible body, and to that only ; does he mention or allude to the soul ?

Does this account furnish a proof of any resurrection, but the resurrection of the body and the body only ?

Does not Christ in effect negative the existence of any separate soul, when exhibiting his body, he says, here, " this is I, myself ?"

Is any one required to believe in the existence of a separate soul, when it is no more noticed on this solemn occasion, than if it did not exist at all?

And why is it not noticed? Because it does not exist. Would such an occasion of explaining and inculcating the doctrine, have been passed by?

Again: *Matt.* xxvii. 53. "And the graves were opened, and many *bodies* of saints that slept arose, and came out of their graves after his resurrection, and went into the holy city, and appeared unto many." This is again a type and an exemplar of man's resurrection: but not one word of the soul.

How is it, some may ask that this corrupt, mortal, and putrefying body, can be the object of the resurrection, and inherit immortality? I answer, that in *Luke* xx. 36, Christ says, "the dead who are raised shall die no more." Of course some change will take place after the resurrection to fit them for immortality. What change, or how it is to be effected; as Christ has not explained, neither do I; and with the promise as he has made it, a christian should be content.

The only passage in the Gospels from which the existence of a separate and immortal soul can apparently be inferred, is *Matt.* x. 28, which in the translation runs thus: "Fear not them which kill the body, but are not able to kill the soul: but rather fear him, which is able to destroy both soul and body in hell." To this I reply, that the word here translated soul, (a) is translated in very many other places indiscriminately, life and soul. Meaning always the life of the body, and never exclusively the soul. Thus, a little way before in *Matt.* vi. 25, it is translated life: "to take no thought for your life." To the same purpose, *Luke* xii. 22. So in *Mark* iii. 4. "To save life or to kill." So in *Luke* xii. 23, "the life more than raiment." *Matt.* vi. 25. *Matt.* x. 39. *Matt.* xvi. 25. *Mark* viii. 36, 37, and in upwards of twenty passages more. In all these passages, the word translated indiscriminately soul and life, is one and the same word. So in *Rev.* xvi. 3, and every living soul died in the sea.

The meaning of the passages therefore, is, that Christ who was appointed to teach and to preach the resurrection unto life, says, "fear not them who can kill the body, but him who can annihilate life itself, and destroy all your hopes of resurrection and a future existence."

I know not any other passage in the Gospels that can be plausibly dragged in aid of the immaterial hypothesis; and I will venture to say, there is not one passage in the bible, so strong in favour of that opinion, as the passage I have just considered: which is manifestly a translation, made by men whose heads were full of the doctrines of a soul, and made with a view to that very opinion.

Again: The following passages all tend to shew that there shall be no resurrection whatever, but as a miraculous interposition of

God Almighty, *through Jesus Christ*, who shall call the dead from their graves, at his own appointed time; until when there shall be no day of judgment: and of course that without the promise of the Christian resurrection, the dead would forever remain dead. This is utterly inconsistent with the notion of the most essential and active part of man, immortal in itself, subsisting in a state of superior intelligence and activity, when freed from the burthen and clog of the human body. When freed from the prison of the body, why, by miraculous interposition, raise up the body to imprison it again? *Matt. xiii. 30—49. Matt. xvi. 27. Matt. xix. 28. Matt. xxiv. 31. Matt. xxv. 31, 32. Mark xiii. 26, 27. John vi. 40, 44, 54. John xvi. 22.* I could add many more passages from the Acts and Epistles, but I purposely confine myself to the Evangelists.

So far as plain fact, universal experience, and the declarations of the scriptures will bear us out, there is no pleasure, and no suffering independent of the animated body, either in this life, or in the life to come. Animation ceases when the body dies; and it will be restored when the body is called up from the grave at the great day in conformity with the promises made to us in the Gospels of Christ. Without those promises, confined to the human race—as a beast dieth, so dieth man; without further hope of sentient existence. At least, the arguments for a future state, are barely probable, independent of the Gospel, and Christ's example. So that to a materialist, the value of a Christian Gospel is unspeakable; to an immaterialist, it is superfluous and even contradictory.

One other argument I will urge, that seems to me to have great weight. The Jews were divided into two sects; the Sadducees who taught that there would be no resurrection, and the Pharisees, who held that there would be one. The inculcations and invectives of Christ, against the Pharisees are vehement, and frequent. Not so against the Sadducees. Among the various conversations and disputes he had with the Sadducees on the subject of a resurrection from the dead, he not only never makes any use of the argument, from the immaterial and immortal nature of the human soul, but he never introduces it at all—not a word is to be found on the subject: its existence is not hinted at.

After this, can it be said, that the separate existence of an immortal soul is the doctrine of Christ? I am lost in utter astonishment at the presumptuous hardihood that can state this doctrine as an essential article of the Christian faith! at the impudent intolerance that can cry down a man's character and standing in society—can interdict him like the banished of old, from fire, water, and shelter—because examining Scripture for himself, he cannot conscientiously accept as divine truth, the metaphysical reveries of Calvinistic theology!

The doctrine of a future state, stands on a much firmer basis, on the supposition of the resurrection of the body, and the body

only, than on the resurrection of the soul, (if indeed this last be not, as I take it to be, a manifest contradiction in terms.) The being whom it shall please God, through Jesus Christ to raise from the dead—from the grave—will be the object of future rewards and punishments in another life, for its deeds, or misdeeds, transacted in this life. I know of no christian materialist who denies this, and I believe it is considered a doctrine probable, but not certain, independent of Scripture, from considerations connected with the moral government of the universe but rendered certain by the Christian Scriptures only. To an immaterialist, the Scripture doctrine of the resurrection is superfluous; for *his* man is essentially immortal in his immortal soul! To a materialist, it is every thing; for it contains the only sure and certain proof of a resurrection, that is to be found within the compass of human knowledge.

And here I take my stand. I hold it useless to urge any further argument. It would be anticlimax in ratiocination. That which is not Jesus Christ's Christianity is not my Christianity. The opinions of the apostles, of the fathers of the church, of grave and learned divines, can add no force to Gospel authority. You cannot fortify stronger evidence by weaker. If you say it may explain or illustrate what is dubious, I deny that any of the essential articles of Christianity, that I have stated, are dubious. You may dispute as much as you please about the human soul, which is not once mentioned in the Gospels, but you cannot deny the resurrection of the body. You may dispute about the nature and grade of Christ's character, but you cannot as a christian dispute his divine mission. I require no other proof that any doctrine is unessential to Christianity, than that it is dubious. Jesus Christ does not require us on pain of eternal damnation to believe on doubtful evidence; although the priesthood does. Could the unlettered audience present at the sermon on the mount, have understood a sentence of the Assembly's Catechism?

The sum and substance of my argument is this:

(a) All that is essential to Christianity is contained in the four Gospels that give us an account of what Jesus taught and did; who certainly would omit nothing essential to his own plan. The doctrine of an immaterial, immortal soul is no where to be found promulgated, explained, or hinted at, in any part of the four Gospels, except in one solitary text where the ambiguity arises from the translation.

(b) The resurrection every where spoken of is the resurrection of the dead,—the resurrection of the body, not of the soul.

(c) This avoiding any notice of the doctrine in question, is the more extraordinary, as frequent opportunities and occasions occurred, that seem to have required, if this doctrine were true, that it should be enforced and explained.

(d) This doctrine of a separate immortal soul, renders unnecessary any miraculous interposition to produce the resurrection of

the dead, for the purpose of future reward and punishment; inasmuch as the soul never dies. It may therefore be a very good tenet for a Deist, but not for a Christian.

(e) This doctrine of an immaterial immortal soul is to the doctrine of the resurrection, a positive and unequivocal denial; for there can be no resurrection of that which never dies.

(f) The example and illustration presented to us by Christ's own resurrection, is a resurrection of the *body* only: not a syllable is said about the soul.

Here ends my argument: but for the sake of those who have a higher opinion of human comments on the doctrines of Christ than I have, I add the following brief observations, tending to shew,

1. That the doctrine of materialism is the doctrine of the apostles.

2. That the doctrine of materialism was the doctrine of the fathers of the Christian church, during four hundred years, until the time of St. Augustine.

3. That it is yet considered as a dubious point in the church of England among the dignitaries eminent for learning in that church.

4. That the doctrine of a separate soul has given rise to great errors and deplorable abuses.

If I should find it necessary (which I hope will not be the case) to come out again on this subject, I will treat these points more at large: at present, my object is condensation and brevity.

Let us now see *what the Apostles say*.

Acts xxiii. 6. Paul cried out, Of the hope and resurrection of the *dead* am I called in question. *Acts* xxiv. 15. That there shall be a resurrection of the *dead* both of the just and unjust. *2 Cor.* i. 9. But we had the sentence of death in ourselves, that we should not trust in ourselves, but in God who raiseth the *dead*. If any declaration can be adverse to the existence of a separate soul, this is. *2 Cor.* iv. 10. Always bearing about in the body the dying of the Lord Jesus, that the life also of Jesus might be made manifest in *our body*. v. 14. Knowing that he which raised up the Lord Jesus shall *raise us up also* by Jesus. This implies similarity in the general resurrection of the human race, and that of our Lord. So in *1 Pet.* i. 3—5. Blessed be God, which according to his abundant mercy hath begotten us again unto a lively hope by the resurrection of Jesus from the dead, to an inheritance incorruptible and undefiled, that fadeth not away. *Rom.* iv. 17. God who quickeneth the dead, and calleth those things that be not, as though they were. *1 Cor.* xv. 42. So also is the resurrection of the *dead*. It is sown in corruption—it is raised in incorruption. What died? The Soul? No: the body died. What then is raised? The Soul? No: that which died, the body. When the body being raised from the dead, is endowed with incorruptibility, to fit it for its new state of being, it still remains the same body, only no longer sub-

ject to death. St. Paul calls the body thus changed a heavenly body, a spiritual body: still it is the body; in all essential respects, the very body that died; for no other is ever spoken of. 2 *Cor.* v. 10. (a) For we must all appear before the judgment seat of Christ, that every one may receive the things done in his body, according to that he hath done whether good or bad. The literal and true version of this passage is "may receive bodily," (*ta dia tou somatos.*) Hence, it is the body that is to receive reward or punishment, according to what the body hath deserved while alive. Not a word of a soul. *Ephes.* v. 23. Christ is the saviour of the body. *Philip* iii. 21. Who shall change our vile body (vile as being mortal and corruptible) and fashion it like unto his glorious body. Not a word of the soul: all relates to the body.

I have looked into the original Greek of all the passages translated soul, from Acts to Revelations, inclusive, and I find the word is *psuche*. In most of these passages, it necessarily means life, and in all of them it is reasonably translated life; except, as some may think, in 1 *Thess.* v. 23, "That your whole spirit, and soul, and body may be preserved blameless unto the coming of our Lord."

The general meaning of the word here translated spirit, when applied to a man, is disposition, inclination: thus,

Matt. xxvi. 41. The spirit truly is willing, but the flesh is weak. That is, they have desire to keep awake, but they are overcome with fatigue.

Luke viii. 55. Her spirit came again, and she arose straightway. That is, her life.

John iv. 23. Shall worship the father in spirit and in truth. That is, in reality, with willingness and unfeignedly.

John xi. 33. He groaned in spirit: *John* xiii. 21. He was troubled in spirit.

Frequently it is put for beings intermediate between men and angels and that only appear occasionally, that being a popular opinion of the day: as when the disciples said he hath seen a spirit or an angel,—the Sadducees say there is no angel or spirit,—and the spirit said unto Philip, go near and join, &c.

It is sometimes put for the power and operation of God.

So the word translated soul, is far more frequently translated life, which is its true meaning.

Hence, the meaning would be, God preserve your disposition, your life, and your body to the time of his coming. That is, I hope you will not change your character or quit this life till the coming of our Lord Jesus; which some of the apostles mistakenly expected to be very soon. But holding myself bound by the highest authority, I am bound by that only. Nor is the main doctrine of Christ in the Gospels to be shaken by a few figurative or pleonastic forms of expression among his disciples. The question is not,

(a) τα δια τῆς σωματικῆς.

is there any text in the Bible that seems to countenance the notion of a soul, (for the Bible was translated by persons who took that doctrine for granted;)—the question is, what is the general tenor of the doctrine on the subject laid down by Jesus Christ: does *he* countenance it? The apostles wrote and spoke very figuratively, and frequently in conformity and allusion to the previous notions of those they were addressing. To establish the doctrine of a soul as a Christian doctrine, do not refer me to a few texts that *seem* to countenance it; you must shew it me plainly, clearly, and undoubtedly laid down, explained, and urged by Christ himself: and that I am sure cannot be done from the Evangelists. All else is evidence so inferior, as to have little weight on the question.

All persons conversant with the Scripture, know, that the various and discordant tenets of metaphysical Christianity are founded, asserted, and denied on the license of figurative expression used by the apostles, and principally St. Paul. In this war of words I desire to take no part, and I therefore appeal exclusively to the Gospels.

OF THE OPINIONS OF THE ANCIENT FATHERS.

I am not yet possessed of the means of examining and referring to the original works of the fathers, as they are called. I must therefore be content with referring to some summary. Such an one Dr. Priestley has given; but I am aware his authority may be objected to. Lewis Ellis Dupin, and Lardner have not attended to this subject as a separate question, and Lardner's quotations are very partial. The only author of repute who has examined all the writings of the Christian fathers with this view, is Beausobre, in his history of Manicheism; an author universally regarded as among the fairest and best qualified of modern days. He too is cited by Priestley, by Rees, and others.

To avoid all reasonable objection, I referred to the article Immaterialism in the larger French Encyclopedie, manifestly written by one who is not a materialist. I translate briefly from that article; stating however, that his representation will coincide with that of M. Beausobre.

“Some moderns suspect that as Athanagoras admitted a spirit in the formation of the universe, he was acquainted with spirituality, and did not admit a corporeal Deity, like almost all the other philosophers. But by the word spirit (*pneuma*) the Greek and Romans equally understood a subtile matter, extremely dilated, intelligent indeed, but extended, and consisting of parts. In effect, how can they believe that the Greek philosophers had any idea of a substance purely spiritual, when it is clear that all primitive fathers of the church made even God Almighty corporeal; and their doctrine was perpetuated in the Greek church even to later times, and was never renounced by the Roman church till the time of St. Augustine,” (about six hundred years after Christ.)

The author of the article proceeds, by means of quotations from their works, to shew that the following fathers were materialists, viz; Origen, whom Jerom reproaches for his notion that God himself was material; Tertullian, who wrote a book *De Anima* expressly to prove the mortality and materiality of the human soul; Arnobius; St. Justin; Tatian; St. Clement of Alexandria; Lactantius; St. Hilarius; St. Gregory Nazianzenus; St. Gregory Nyssen; St. Ambrose; Cassian; and finally John of Thessalonica, who, at the Seventh Council, pronounced it as an opinion traditionally delivered by St. Athanasius, St. Basil, and St. Methodius, that neither angels, demons, nor human souls were disengaged from matter. The writer forgot Melito, bishop of Sardis; but here is a list quite long enough. It proves nothing except that in the early ages of the Christian church, and for near six hundred years, Materialism was not heresy, but quite otherwise. Indeed St. Austin says, that he himself was for a long time of this opinion; owing to his difficulty of conceiving the pure spirituality of God himself—Are these metaphysics of any use or value to a Christian, on the one side or the other. I consider them as vain speculations, unproductive of practical benefit.

The Apostles' Creed of uncertain composition, but ancient, requires us to hold as an essential article of the Christian faith, what, the resurrection of the soul. No, "the resurrection of the body, and the life everlasting." Amen.

THAT THE DOCTRINE OF THE NON-EXISTENCE OF A SEPARATE IMMATERIAL SOUL, DISTINCT FROM THE HUMAN BODY, AND DISJOINED FROM IT AT DEATH, IS A DOCTRINE PUBLISHED AND AVOWED BY DIGNITARIES OF THE CHURCH OF ENGLAND.

I apply this to the well meaning, but not well instructed portion of my fellow citizens. I am not about to prove my point by an appeal to the bench of bishops. But I say, that doctrine is not Atheism, Deism, or Infidelity, which some of the bench of bishops avow, which others doubt about, and which none complain of as heretical or dangerous.

Dr. Edmund Law,* Arch Deacon of Carlisle, Master of Peter's College in the University of Cambridge, (a seminary for finishing the education of young men,) wrote a treatise on the nature and end of death. To the third edition of this work, now before me, published in 1775, he added an appendix on the meaning of the original words translated *soul and spirit* in the holy Scriptures; shewing that no part of the bible gave countenance to the doctrine of a separate soul, or of an intermediate state of being between death and judgment. He refers to Bishop Sherlock, the Rev. Mr. Taylor of Norwich, and Mr. Hallet, in the following passage closing that appendix.

*Father of the late Lord Ellenborough, Chief Justice of the King's Bench.

Extract from the Appendix to Considerations on the Theory of Religion. By Edmund Law, D. D. Archdeacon of Carlisle, and Master of St. Peter's College, Cambridge, third edition, 1755—with an appendix concerning the use of the word SOUL in Holy Scripture, and the state of death there described.

“The intent of this appendix, containing an examination of all the meanings that the words translated SOUL, in the Old or New Testament, appears to have, is to shew that the doctrine of a separate, immaterial, immortal soul, is not a Christian doctrine: that it is not fairly deducible from the Christian Scriptures; and is contrary to their general tenor.” Dr. Law, after this summary, goes on to say, page 398, “This may serve for a specimen of such texts as are usually alleged on the other side of the question; (*viz.* by the Immaterialists,) all which will, I believe, appear, even from these short remarks upon them, to be either quite foreign to the point, or purely figurative; or lastly, capable of a clear and easy solution on the principles above-mentioned. Nor can such ever fairly be opposed to the constant obvious tenor of the sacred writings, and that number of plain express passages already cited.” page 400.—Give me leave, says Dr. Law, to subjoin the sentiments of a very pious and worthy person, eminently skilled in Scripture language, the Rev. Mr. Taylor of Norwich, who is pleased to write as follows: “I have perused your papers, &c. They comprehend two points, one upon the *nature of the human soul or spirit*, so far as revelation give us any light; the other concerning the *state to which death reduces us*. From the collection of Scriptures under the first of these points, I think it appears, that no man can prove from Scripture, that the human soul is a principle which lives, and acts, and thinks, independent of the body. Whatever the metaphysical nature, essence, or substance of the soul may be, (which is altogether unknown to us,) it is demonstratively certain that its existence, both in the manner and duration of it, must be wholly dependent on the will and pleasure of God. God must appoint its connection with, and dependence on any other substance, both in its operations, powers, and duration. All arguments, therefore, for the natural immortality of the soul, taken from the nature of its substance or essence, as if it *must* exist and act separate from the body, because it is of such a substance, &c., are manifestly vain. If indeed we do find any thing in the faculties and operations of the mind to which we are conscious, that doth shew it is the *will of God*, we should exist in a future state, those arguments will stand good. But we can never prove that the soul of man is of such a nature that it can and must exist, live, think, act, and enjoy, &c., separate from, and independent of the body. All our present experience shows the contrary. The operations of the mind depend constantly and invariably upon the state of the body, of the brain in particular. If some dying persons have a lively use of their ra-

tional faculties to the very last, it is because death has invaded some other part, and the brain remains sound and vigorous. But what is the sense of REVELATION? You have given a noble collection of texts, that shew it very clearly. The subject yields many practical remarks, and the warmest and strongest incitements to piety."

After this extract from Mr. Taylor's letter, Dr. Law closes his appendix in these words: "But it might look like begging the question, should I draw out all these in form, together with the consequences of this doctrine in regard to either Papist or Deist, till the doctrine itself, so long decry'd by the one, and so often disgraced by the other, shall appear free from the prejudices attending it, and be at last understood to have a fair foundation in Scripture, by which we Protestants profess to be determined: and when we have duly examined them, may possibly discern *that the natural immortality of the human mind, is neither necessarily connected with, nor to a Christian any proper proof of a future state of rewards and punishments.*"

After this, Dr. Law was raised to the See of Carlisle.

Dr. Watson, Bishop of Landaff, published a collection of tracts for the use of young clergymen. The following is an extract from his Preface.

Extract from a preface to a collection of Theological Tracts, in six volumes. By Richard Watson, D. D. Bishop of Landaff, and Regius Professor of Divinity in the University of Cambridge, 1785. Dedicated to the Queen.

Page 14, 15.—"Want of genuine moderation towards those who differ from us in religious opinions, seems to be the most unaccountable thing in the world. Any man who has any religion at all, feels within himself stronger motives to judge right, than you can possibly suggest to him; and if he judges wrong, what is that to you? To his own master he standeth or falleth: his wrong judgment, if it affect his own salvation, cannot affect yours! For, in the words of Tertullian, *nec alii obest aut prodest alterius religio*. Still you will probably rejoin, there must be many truths in the Christian religion, concerning which no one ought to hesitate, inasmuch as without a belief in them, he cannot be reputed a Christian—reputed! by whom? by Jesus Christ his Lord and God, or by you? Rash expositors of points of doubtful disputation; intolerent fabricators of metaphysical creeds, and incongruous systems of Theology! Do you undertake to measure the extent of any man's understanding except your own; to estimate the strength and origin of his habits of thinking; to appreciate his merit or demerit in the use of the talent that God has given him, so unerringly, as to pronounce that the belief of this or that doctrine is necessary to *his* salvation?"

Page 16.—"But there are subjects on which the academical-

rum epoche (a) may be admitted, I apprehend, without injuring the foundations of our religion. Such are the questions which relate to the power of evil spirits to suspend the laws of nature, or to actuate the minds of men ; to the materiality or immateriality of the human soul ; to the state of the dead before the general resurrection ; the resurrection of the same body ; the duration of future punishments ; and many others of the same kind."

THAT THE DOCTRINE OF A SEPARATE SOUL, HAS GIVEN RISE TO ERRORS AND ABUSES.

The vulgar notion of apparitions—the worship of Saints—the doctrine of purgatory until the day of judgment—prayers for the dead, &c.—Had the opinion been credited, that when the man dies, he will remain dead till it shall please God at the great day to reanimate him, none of these opinions could have prevailed, nor could any of the abuses founded on them, have existed.

I omit the many difficulties attending this opinion, as—how is an immaterial and immortal soul corporeally propagated ; when did it begin to exist ; how will you account for the undeniable marks of memory, intelligence, and volition, in dogs and other brute animals ; have *they* souls also ; how can the soul act upon matter if it have no property in common with matter ; how does the soul differ from the *life* of the body ; can you account for the life of a blade of grass by mere matter and motion, any more than the life or intellect of a human being ; do not vegetable and animal life depend on organization ; what real evidence can be had of a being, which is in no respect the object of any sense we possess, only known by metaphysical conjecture, as an hypothesis to account for thought, &c. ?

To all this, the Immaterialists say, that no mode or combination of matter and motion *can* produce thought : and this being impossible, there is an end of the question. But we see life connected with, and arising from a modification of matter and motion, as in vegetables ; what is life ? We see life, sensation, thought, volition, arising from a combination of matter and motion, as in elephants, dogs, horses, &c. ; if phenomena, exactly the same in kind, require a soul in the animal man, so they do when observed in an inferior degree, in inferior animals ; where will you stop ? Will you assign a soul to an opossum or an oyster ? To a mite or a flea ? All this peremptory dictation of what can be or cannot be, with our limited knowledge, appears to me dreadful arrogance !

I call then upon my opponent, and I ask him,

From what source of knowledge is it, that *you* who know nothing about matter, but some of its properties, and nothing of its essence—that *you*, who gaining knowledge by your senses only, cannot possibly know any thing of spirit which is not cognizable

by the senses—presume to limit the omnipotence of the Almighty and declare that he is not able to endow matter with the properties of thought?

Worm as you are, is Almighty power to be confined within the outline of your metaphysical creed? Are *you* possessed of infinite intelligence, and entitled to say to the creator of the universe, thus far shalt thou go and no further?

Away with your arrogance, and your intolerance—with your cruel interdictions and denunciations; and permit a fellow creature to be humble with impunity, though *you* disdain to be so!

APPENDIX ON THE CLERGY.

CIVIL society is intended to promote the mutual happiness of the members of it, while they live together here on earth. It does not extend to a future state of existence, which will take place under such regulations as the Almighty may think fit to appoint.

Religion embraces all the motives to good conduct here, and all the means of happiness hereafter. Civil society, therefore, has nothing to do with religion, but as it tends to mutual happiness while we live together here on earth. Hence, that religion which makes a man the best citizen, is the best religion for society. A religion that makes a man cruel, persecuting, and intolerant, is a bad religion for society; and the teachers and preachers of any religion whatever, who are so, are bad men and bad citizens, whether their opinions be true or false. I wish some one would undertake to shew how public morals are promoted by the doctrines of death-bed repentance, election, and reprobation, and the final salvation of backsliding saints.

The wise men who framed the American constitutions, well knew the truth could only be discovered, and placed on a firm basis, by permitting free discussion on every subject. If an opinion be erroneous, it requires discussion, that its errors may be exposed: if it be true, it will gain adherents in proportion as it is examined. Is an opinion so manifestly wrong that every man must see it is so? It can do no harm. Is it so plausible as to be likely to deceive mankind by its semblance to truth. The more need, then, of open and free discussion to expose fully the fallacy of it.

Moreover, as the American legislators well knew the infirmities of human nature, and that no set of men had any pretensions to infallibility, they put all opinions upon the same footing as to each other, and left truth to prevail by its own force and intrinsic evidence. In no other country is the wise toleration established by law, so complete as in this. But in no country whatever, is a spirit of persecution for mere opinions, more prevalent than in the United States of America. It is a country most tolerant in theory, and most bigotted in practice. The laws control no man's

opinions; they control his conduct only. They guarantee freedom of conscience, of profession, and of discussion to every creed and form of worship; the framers of them, well knowing that the result of conflicting opinion and open discussion, can only be truth; and that no opinion deserves to be protected, which cannot protect itself.

But the clergy of this country, I hope not of all sects, the Calvinistic clergy chiefly, are united in persecuting every man who calls in question any of their metaphysical opinions, or who hints at their views of ambition and aggrandizement. They dare not actually stab him or burn him: but they raise the out-cry of mad dog; they villify him; they give him nick names; they hoot at him as infidel, deist, atheist; they set the ignorant upon him to abuse his person, character, and conduct; they treat him with open revilings; they urge him with clandestine falsehoods, and they interdict him as far as possible from all intercourse with society. Then it is they exult, when their secret lies have blasted his character, and their open denunciations have blasted his prospects in society. There are individual exceptions to this picture; but it is faithful as a representation of the body. I know and have felt their unprovoked hostility, and their rancorous combinations. Cowardly and cruel, their machinations are private, and their enmity unforgiving. What earthly reason can a man have to dread discussion, but that his opinion will not bear it? What makes men cruel, but their cowardice? Calvin procured Servetus to be burnt to death. Whom did Jesus Christ burn? Yet has that gloomy murderer of Geneva more zealots devoted to his intolerant creed in the United States, than in any other part of the globe. Why? because it is a fit instrument in the hands of the clergy, in proportion as it is intolerant and unintelligible. Weak minds have a vast opinion of the knowledge of those who pretend to be familiar with truths that appear so mysterious. It is in the fetters of mystery that the priesthood binds and bends the spirit and the consciences of their ignorant hearers. The religion of the Gospel is too plain and simple for their purposes; hence their ardent efforts to establish their own mysterious creed. In what country has it been, that the priesthood as a body have not been cruel, and persecuting, dreading contradiction, hating discussion, and holding every doubter as a concealed enemy? They are so here.

Fellow citizens—The Presbyterians of these States, the Congregationalists, the Seceders, and in some places the Baptists, dragging after them the timid Episcopalians, have combined, and for many years have been steadily prosecuting the following schemes, with a perseverance and devotedness worthy of a better cause.

They are steadily aiming at a CHURCH ESTABLISHMENT; at an alliance between church and state; so as to bring the civil power in aid of their own plans of aggrandisement.

They are steadily aiming in their pamphlets and their preachings, to establish the religious obligation of paying TYTHES of all you possess ; in strong hopes of procuring this system to be established also by law. This will render them not only wealthy, but independent of their congregations, whom they consider as by right dependent upon them ; assuming openly the character of God's vicegerents, and branding all opposition to their ambitious designs as blasphemy. They are steadily aiming to obtain the entire control of every seminary of EDUCATION, throughout the United States ; claiming the exclusive superintendence of them, as a matter of right. This is done with a view of infusing into the minds of the rising generation, an implicit reverence for the priesthood, and an attachment to the views and interests of the priesthood.

They look with a jealous eye at every *scientific* discussion ; prohibiting, so far as they dare, all investigations that do not harmonise with their own theological creed. Their interference has been recent and violent, with respect to physiological, zoological, and geological discussions. No printer, no editor of a scientific journal, dare insert an article in favor of any opinion which the clergy have pronounced heterodox. Fanaticism has completely clipped the wings of science in this country. They have organized a stupendous scheme of raising a PECUNIARY FUND, to uphold their pretensions, by picking the pockets of the people under some or under all of the following pretences.

The *educating* of pious young men (as they are called) to the ministry. That is, taking those who ought to be tillers of the ground, and hiring them, by a theological education, as slaves for life to the propogation of those tenets, by which the interest and the views of these sects are best promoted. After having been thus educated, *apparently* at the expense of these sectarians, and *really* by means of the funds extracted from the folly, the indolence, the timidity, or the good nature of the public, they hold themselves bound to the doctrines and interests of their preceptors, and become the standing army of the church militant. The establishment of *missionary* societies, to furnish the East Indians, the American Indians, the Australasians, and the Africans, with parsons, who can neither speak the language of their hearers, or make themselves understood. The subscribers to these institutions, seldom or never look after the sums they subscribe, which are under the absolute control of these manufacturers of missionaries ; whose object is not missionaries, so much as men devoted to their interest, when they shall come out in favor of a church establishment and tythes.

Societies to make *ministers of individual congregations* trustees for life of these missionary societies ; and of course, to have a voice in disposing of the sums thus elicited from the people's pockets. What the missionaries are, and how they live when

they can get the means, I hope some one will shew by exhibiting the style of luxury of the Serampoor missionaries.

Prayer Meeting Societies, which, by means of the weak and credulous females who attend them, furnish the priests with a sure source of influence and information over the domestic concerns of every family.

Female benevolent and missionary societies; female mite societies; for no sum is too small for their acceptance; *Juvenile societies* of children, who are cajoled out of their 6 cent and 12 cent pieces; cheated out of their ginger-bread money, to give to institutions of which they hardly know the name. No sum is too small for acceptance, and no plan too mean to acquire it. *Missionary fields* of corn, wheat and potatoes; missionary hog societies; missionary rag-bag societies, and missionary scrap societies. All means of scraping together money, the most trifling and contemptible, are employed by these men: not individually, but corporately, and *en masse*.

But their most profitable concern, is that of becoming authors, printers, and booksellers. Composing, praising, recommending religious tracts, sermons, and almanacs. The Bible society, interfering with the regular printing trade, cannot have less than \$150,000 engaged, which brings a good interest to the persons who conduct it.

Such are the means of satisfying the craving for *Money, Money, Money*, employed by this ambitious, avaricious and crafty set of men. In all other respects, they are more devoid of useful knowledge than any other class of persons in the community. But they act in concert: they have thrown their fetters over the minds of the people—they have cowed the spirit of the community—the literary classes are compelled to succumb to them—they look forward to the day when they shall govern the Union in their own manner, and in mean time, take good care to plunge their hands deep in the pockets of those whom they can flatter or frighten into acquiescence and submission.

If the people do not keep the CLERGY under control, they will bring the people into abject slavery, and keep them there. In every nation upon earth, they have done so; what should change their character here? It is in the year 1822, that the clergy of Austria have persuaded the monarch over 40 millions of people to say, "I want no men of science, I want only obedient subjects. I want no education among my subjects, but what is given by the priesthood." Look at the priesthood in France, Spain, Italy, Mexico, even in England: is not their general character one and the same? Already has the religious arrogance of this order of men, tempted them to assume the character of God's immediate agents and vicegerants—placed at an immense distance from the herd of inferior beings who compose their congregations. Look at New York and Philadelphia papers, for instance. "BY DIVINE

PERMISSION, on such a day the Rev. Mr. A. will perform divine service at such a place." Latterly (that is, within a few months) this style of annunciation has not been so frequent; but for a twelvemonth it was quite the fashion.

In what part of the New Testament has Christ said, you cannot approach the Father but through the agency of men divinely commissioned from among you for the purpose, and well paid for their services? Has he not said, where two or three are gathered together in my name, there am I in the midst of you? And yet these men scruple not to declare that any religious exhortation by a layman, any usurpation of the functions usually performed by a hired and paid priest, is not only improper and indefensible, but a SIN! and Dr. *Ashbel Green*, of Princeton, has recently denounced such persons as presumptuous and sinful intruders on the rights of the priesthood! They claim it as a *right* to be exclusively hired, and well paid; and we patiently submit to it! as if the God of Love, the kind Father and preserver of the human race, were a gloomy, haughty tyrant, not to be approached but through the intervention of these arrogant ministers of state, who take good care to be remunerated for their intercession.

I have no objection to a ministry appointed as a convenient and expedient class of men, that the religious business of a district may be conducted decently and in order; but upon no other ground. And although I should prefer well educated and liberal men for this purpose, I see no reason for giving them an exclusive preference. In the purest times of Christianity, the elders of the church transacted the religious business of it. Did Jesus Christ choose his disciples whom he nominated to preach the Gospel, from among the learned and the wise? Mankind are pestered with the *rights of the priesthood!* rights! what rights? who pays them, who supports them? who enables these drones in the hive, to fatten on the labours of the industrious bee? who seem to glory in being ignorant of all useful knowledge, and skilled only in the quarrelsome questions and senseless jargon of metaphysical divinity.

It is the idleness, the pride, the aristocracy of rank and wealth, that has rendered a priesthood necessary. People are too indolent or too timid to pray for themselves, and they hire a priest to pray for them! Then too, their ears must be tickled by eloquent discourses; as if religion needed eloquence to enforce it! surely all this is not necessarily and essentially religion! Fellow citizens, you aid these impostors to cheat you, by making them necessary to you. Let them know they are your servants; that they are not as they claim to be, your masters; let them know that you hire them and you pay them; and they will not be a whit the less pious for being more humble.

These views of the subject are well worth your consideration. The priesthood in every age, in every country, forbid discussion, frown down all investigation; they require, like other tyrants,

passive obedience and non-resistance. They denounce every man who opposes their views: not merely their spiritual, but their temporal views. Their intent here, as elsewhere, is to fetter your minds first, and your bodies afterwards; and finally, to command your pockets.

It is high time to warn the people, that their liberties are in danger; that they are about to be undermined by a crafty, persevering, insidious foe in the imposing garb of a heavenly friend. It is high time to call upon the honest citizens of this yet free country, and to sound the watch word

Blow ye the trumpet in Zion!

TO DR. THOMAS COOPER.

MONTECELLO, DEC. 11, 1823.

DEAR SIR:

I duly received your favor of the 23d ult. as also the two pamphlets you were so kind as to send me. That on the tariff, I observed, was soon re-printed in *Ritchie's Enquirer*. I was only sorry he did not postpone it to the meeting of Congress, when it would have got into the hands of all the members, and could not fail to have great effect, perhaps a decisive one. It is really an extraordinary proposition that the agricultural, mercantile and navigating classes should be taxed to maintain that of manufactures.

That the doctrine of Materialism was that of Jesus himself, was a new idea to me. Yet it is *proved unquestionably*. We all know it was that of some of the early Fathers. I hope the physiological part will follow; in spite of the prevailing fanaticism, reason will make its way. I confess that its reign at present is appalling. General education is the true remedy, and that most happily is now generally encouraged. The story you mention as gotten up by your opponents, of my having advised the Trustees of our University to turn you out as Professor, is quite in their style of bare-faced mendacity. They find it so easy to obliterate the reason of mankind, that they think they may enterprise safely on his memory also: for it was the winter before the last only, that our annual report to the Legislature, printed in the newspapers, stated the precise ground on which we relinquished your engagement with our Central College. And, if my memory does not deceive me, it was on your own proposition, that the time of our setting into operation being postponed indefinitely, it was important to you not to loose an opportunity of fixing yourself permanently: and that they should father on me too, the motion for this dismissal, than whom no man living cherishes a higher estimation of your worth, talents and information. But so the world goes. Man is fed with fables through

life, leaves it in the belief that he has known something of what has been passing, when in truth he has known nothing but what has passed under his own eye. And who are the great deceivers? Those who solemnly pretend to be the depositories of the sacred truths of God himself! I will not believe that the liberality of the State to which you are rendering services of science which no other man in the Union is qualified to render it, will suffer you to be in danger from a set of conjurers.

I note what you say of Mr. Finch; but the moment of our Commencement is as indefinite as it ever was. Affectionately and respectfully,

Yours,

TH. JEFFERSON.

Mr. Jefferson was not aware that Materialism is the real doctrines of Jesus Christ, until I sent him the preceding tract: See his letter to W. Short, April 13, 1820, in the 4th volume of his correspondence, p. 320. "*But while this syllabus is meant to place the character of Jesus in its true light as no imposter himself, but a great reformer of the Hebrew code of religion, it is not to be understood that I am with him in all his doctrines. I am a MATERIALIST; he takes the side of SPIRITUALISM,*" &c. &c. See also his letter to Mr. J. Adams, Aug. 15, 1820, same volume, p. 331, 332.

"*When once we quit the basis of sensation, all is in the wind. To talk of IMMATERIAL existence is to talk of NOTHINGS. To say that the human Soul, Angels, God, are immaterial, is to sayt they are nothings, or that there is no God, no Angels, no Soul. I cannot reason otherwise. But I believe I am supported in my creed of Materialism by the LOCKES, the TRACYS, the STEWARTS. At what age of the Christian Church this heresy of IMMATERIALISM, or masked Atheism crept in, I do not exactly know;* but a heresy it certainly is. Jesus TAUGHT nothing of it. He said, indeed, God is a spirit, but he has not defined what spirit is, nor has he said it is not MATTER, &c. See also letter to J. Adams, April 11, 1823—p. 364.*

The syllabus, he mentions in his letter to W. Short, was a brief view of the character, &c. summary of the doctrines, theological and moral, of Jesus Christ, taken from *his own expressions*. It was first sent, I believe, to Dr. Rush. It is worthy of notice, how careful he was that it should not get abroad among the public, owing to the rancorous hatred with which he was pursued during a great part of his most useful life by the clergy. It is melancholy to think that such a man should have reason to fear the publication of such a work, in this enlightened country! *Pudet hæc approbria nobis et dici potuisse, et non potuisse refelli!*

* At the Council of Nice, A. D. 324.

A
VIEW OF THE
METAPHYSICAL AND PHYSIOLOGICAL
ARGUMENTS
IN FAVOR OF
M A T E R I A L I S M.

FIRST PUBLISHED AT WARRINGTON, ENGLAND, IN

1781.

BY THOMAS COOPER, M. D.

Ποιησον δ' αιθρην; δος δ' οφθαλμοισιν ιδεσθαι
Εν δη φαιω και ολεσσον.

Grant us day light and fair play.—HOMER's Ili. p. 646.

RE-PUBLISHED WITH SOME ALTERATIONS,
AND SOLD BY A. SMALL,
PHILADELPHIA.
1823.

THESE PAGES
ARE RESPECTFULLY SUBMITTED
TO THE MEDICAL GENTLEMEN OF THE
UNITED STATES,
AS THE MOST COMPETENT JUDGES OF THE ARGU-
MENTS CONTAINED IN THEM.

ON THE SOUL.

THE ARGUMENT IN FAVOR OF THE SEPARATE EXISTENCE OF AN IMMATERIAL SOUL JOINED WITH AND PLACED IN THE HUMAN BODY, IS AS FOLLOWS.

MAN consists of a body, which, when living, exhibits a peculiar organization, and certain phenomena connected with it, termed intellectual; such as perception, memory, thinking or reasoning, and willing or determining. When the body ceases to live, it becomes decomposed into carbon, azote, hydrogen, oxygen, phosphorus, and lime; and perhaps another substance or two: all of them similar to what we find in the inanimate material bodies around us. We differ from them, so far as we can judge by our senses, in no way, but in possessing a peculiar organization which those bodies have not. But as no configuration or disposition of the particles of which our bodies are composed, can amount to anything more than varieties of position—varieties of matter and motion, we have no reason to ascribe perception, memory, thought, or will, to any form of matter and motion, however varied. From matter and motion, nothing but matter and motion can result. The phenomena of intellect are too dissimilar to allow us to consider them as the result of, or as varieties of matter and motion. We must, therefore, recur to some other principle as the source of intellect; and that cannot be the body. It must be something different from mere matter and motion, something immaterial, something that has no relation to matter: that something, be it a separate being, or a separate principle, is the Soul. Will any arrangement of carbon, azote, hydrogen and oxygen, produce a syllogism? Having no relation to matter, being essentially immaterial, this source of intellect is not, like matter, liable to decomposition and decay: it is therefore immortal: it dies not when the body dies. It puts a future state therefore, out of doubt, for it lives when the body is no more.

Such are the views generally taken of this question by those who believe in the separate existence of an immaterial *Soul* as the cause and origin of all the phenomena termed mental or intellectual. With them, it is absurd to ascribe the sublime fictions of poetry, or the sublimer disquisitions of Newton and La Place, to a mere arrangement of assimilated particles of the grossest kind; possessing, before their entrance into the body, and when thrown

by the exhalent vessels out of it, nothing approaching the nature of intellect under any of its denominations.

In the present view of the subject, all arguments of a theological nature are excluded. They can be considered apart: and they are to the full as difficult of solution, as the arguments deduced from natural phenomena; and are productive of as much practical discrepancy.

The Immaterialists of modern days are led on still further. They say that the tendency to organization itself, and all the results of that tendency, must have been originally imparted and communicated to inert matter, which could not have assumed this tendency by any effort of its own. That organization, life, and the properties connected with life, as feeding, digestion, assimilation, excretion, &c. as well as the phenomena termed intellectual, cannot arise from any known property of matter as such; and therefore must have been originally impressed by that Being to whom all creation is to be ascribed. That the phenomena termed intellectual, are clearly distinguishable from the other phenomena of living organized matter—they are peculiar to the human species—not to be accounted for from the common properties of organization or life, and are therefore owing to a separate and distinct communication from the author of our common existence. That not being ascribable to any form of organization, or to be regarded as the result of it, they must of necessity be ascribed to some separate being of a different and superior nature from matter; destined during the present life to act by means of the bodily organs. This separate being is the *Soul*. It is granted that we are not to argue from the possibility of any thing, to its actual existence, (*a posse ad esse non valet consequentia*;) but when the phenomena cannot be explained by any known properties of organized or unorganized matter, we are of necessity driven to something else than—something beside matter—something which is not matter, to explain appearances that are not material.

I do not know how to state better, more fairly, or more forcibly, the views taken of this question by the writers who contend for the separate existence of the Soul, as a being perfectly immaterial, and by consequence incorruptible and immortal.

ON THE OTHER HAND,

The *Materialists*, who ascribe all the phenomena termed intellectual, to the body; and consider them as the properties of organized matter, the result of that organization—reason as follows:

Their arguments may be considered, as 1. *Metaphysical*, and 2. *Physiological*.

To begin with the FIRST class.

1. The only reason we have for asserting in any case that one thing is the property of another, is the certainty or universality with which we always find them accompanying each other. Thus, we say gold is ductile, because we have always found gold, when

pure to be so. We assert that manure will nourish a plant—that muscular fibres are irritable—that the nerves are the instruments of sensation, &c. for the same reason. Let the reader sit down, and describe a mineral by its characters, and he will have no doubt of the truth of this assertion.

Moreover, finding by experience that every thing we see has some *cause* of its existence, we are induced to ascribe the constant concomitance of a substance and any of its properties, to some necessary connexion between them. Hence, therefore, *certainity and universality of concomitance is the sole ground of asserting or supposing a necessary connexion between two phenomena.* And we cannot help believing that like consequences will invariably follow like antecedents under like circumstances. For thus we reason: if two circumstances, or things, always present themselves to our observation accompanying each other—the one always preceding, the other always following—there must be some reason in the nature of things why it should be so.

There is a necessary connexion between such a structure as the nervous system in animals, and the property of sensation, or as it is often called, PERCEPTION*—the property of feeling, of being conscious of impressions made upon our senses. For there is precisely the same reason for making this assertion, as there can be for any other the most incontestable; namely, the certainty and universality wherewith (in a healthy state of the system) we observe perception and the nervous system accompany each other. The seat of perception, so far as we know from the facts of anatomy and physiology, is situated at the internal sentient extremity of the nerve impressed. But be it there or elsewhere, as it manifestly belongs to the nervous system, that is sufficient for the purpose. It must be somewhere. Let the reader, according to his best judgment from known facts, place it where he thinks fit, and it will equally serve the purposes of my argument. Perception, sensation, feeling, consciousness of impressions, (for all these terms have been used synonymously; I prefer the first,) is a property of the nervous apparatus belonging to animal bodies in health and life. When the sentient extremities of a nerve are excited or impressed, perception is the certain instantaneous result, as surely as the peculiar weight, color, ductility, and affinities of gold are the result of gold, when obtained pure. These properties are inseparable. You must define gold by them: in like manner, you must define the properties of the nervous system by perception—sensation.

I consider this argument as conclusive; unless it can be shewn *how* perception results necessarily from something distinct from, and independent of the nervous system; or that, whether this can

* The French writers call it conscience, *consciousness*. The English adopt *perception*.

be shewn or not, the assertion that perception does so result, implies a contradiction, and therefore is at all events inadmissible. As to the *how*—the mode and manner in which perception results from the stimulations of the nervous system—how or why it is, as we see it to be, a function of the brain—no one can pretend to shew or to explain; any more than we can shew or explain how an immaterial soul can act on a material body without having one property in common with it. In the first case we feel in ourselves, and we know by observing others, that perception, feeling, or consciousness is a function of that visible organ; but of the existence of a separate soul, we know nothing but by conjecture. We know that irritability and contractility are properties of the muscular fibre, but beyond the mere fact of its being thus, we know nothing. Can we explain the life and growth of a blade of grass?

That certainty and universality of concomitance is the sole ground for asserting a necessary connexion between two phenomena, or that the one is the result of the other, is so true, that if this be false, no argument from induction can possibly be true: for all proofs from induction imply the truth of this. And as no direct contradiction has ever been attempted to be shewn in the assertion that perception is the result of organization—as the matter of fact, so far as our senses can judge, is plainly so—and as no immaterialist has ever yet pretended to account *how* perception results from an immaterial rather than a material substance—there is nothing more requisite to prove that perception is really and truly the result of our organization. The argument then stands thus: Certainty and universality of concomitance between two or more phenomena, are the only direct reasons we have, for asserting or supposing a necessary connexion between them. The property of perception and a sound state of the nervous system under excitation, are certainly and universally concomitant. Therefore, this concomitance furnishes the only direct reason we have for asserting a necessary connexion between perception and the nervous system. But this reason is the same that we have for asserting a necessary connexion between any other phenomena whatever. Therefore, we have the same reason for asserting a necessary connexion between the property of perception and a sound state of the nervous system, as for asserting the same thing of any other phenomena whatever. It will be understood of course, that the nervous system must be excited, before the excitement can be perceived; and whether we adopt Hume's phraseology, or that of Dr. T. Brown in his *Treatise on Cause and Effect*, the argument will be exactly the same. In all cases, where the necessary connection between two phenomena is such, that the one is denominated a *property*, and the other the *subject* of which the first is a property, the property is universally deemed to result necessarily from the nature or essence of the subject to which it belongs. But as perception must be a property of something;

and as it is uniformly connected with a sound state of the nervous system, perception is a property of that system, and results necessarily from the nature or essence thereof.

Such is the proper and direct proof of the doctrine of *Materialism*; which, so far as I am acquainted with the controversy, REMAINS UNANSWERED. But this doctrine will receive additional support, if the opposite doctrine of *Immaterialism* can be shewn impossible or improbable. I shall endeavour to do both.

Of the Impossibility of the Existence of an Immaterial, Indiscernible, Immortal Soul.

2.—(a) The Soul hath *all* the properties of matter and no other: or it hath some properties *in common* with matter, and *some* that matter hath not: or it hath *no* property in common with matter.

In the first case, it is matter, and nothing else.

In the second case, it is partially material.

In the third case, it is in no respect of degree material. This the last case is the only one of the alternatives that the hypothesis of Immaterialism can consistently maintain: for in so far as the soul is material, it will be discernible, mortal, and corruptible, as matter is.

(b) But let the Soul have no property in common with matter. Then I say: Nothing can act upon another but by means of some common property. Of this we have not only all the proof that induction of known and acknowledged cases can furnish, but that additional proof also which arises from the impossibility of conceiving how the opposite proposition *can* be true. You cannot erect the Coliseum at Rome by playing Haydn's Rondeau. You cannot impel a ray of light by the mace of a billiard table, and so on. This proposition is every where admitted, or assumed in treatises on natural philosophy.

But by the proposition, the Soul hath no property in common with matter. Whereas by the universal acknowledgement of Immaterialists, the Soul acts upon and by means of the material body: but it is a contradiction to suppose that the Soul can and cannot, does and does not, act upon the material body: and therefore, the hypothesis involving this contradiction must fall to the ground.

3. (a) Whatever we know, we know by means of its properties, nor do we, in any case, know certainly any thing but these. Gold is heavy, yellow, ductile, soluble in aqua regia, &c. Suppose gold deprived for an instant of all these properties—what remains, would it be gold? If it have other properties, it is another substance; if it have no properties remaining, it is nothing; for nothing is that which hath no properties. Hence, if any thing lose all its properties, it becomes nothing; it loses its existence.

(b) Now the existence of the soul is inferred like the existence of every thing else, from its supposed properties, which are the in-

intellectual phenomena of the human being, perception,* memory, judgment, volition. But in all cases of *perfect* sleep—of the operation of a strong narcotic—of apoplexy—of swooning—of drowning where the vital powers are not extinguished—of the effects of a violent blow on the back of the head—and all other leipthymic affections—there is neither perception, memory, judgment or volition; that is, all the properties of the Soul are gone, are extinguished; therefore the Soul itself loses its existence for the time; all evidences and traces of its existence are lost; *pro hac vice*, therefore, and during the continuance of these derangements of the nervous system, the Soul is dead, for all its properties are actually extinguished. The Soul, therefore, is not immortal, and of consequence it is not immaterial.

(c) This disappearance of all intellectual phenomena in consequence of the derangement of the nervous apparatus of the human system, is easily accounted for, if they be considered (as the Materialists consider them) no other than phenomena dependent upon the nervous system in its usual state of excitement by impressions *ab extra*, or motions dependent on the sensitive surfaces of the internal viscera, and on association originating *ab intra*. On this view of the subject, all is natural and explicable. But if these intellectual phenomena are the evidences and properties of a separate immaterial being (the Soul) then comes the insuperable difficulty—where is the subject itself when all its properties, all evidences of its existence are annihilated; though but for a day or an hour. A materialist can easily account for returning animation by renewed excitement from the unsuspended action of the functions of organic life.

4. No laws of reasoning will free us from the bondage imposed by matters of fact. It is impossible to deny that all these intellectual phenomena, these peculiar properties of an immaterial Soul, these only evidences of its existence, are also properties of the body: for where there is no nervous apparatus, as in vegetables, they never appear; nor do they appear in the embryo or the infant, till the encephalon is developed; where the nervous system is deranged by violence, or by disease, or by medicine, these phenomena are also deranged, and even disappear; when the body dies and the nervous system with it, all these phenomena cease, and are irrevocably gone; we never possess after death, so far as our senses can inform us, the slightest evidence of the existence of any remaining being, which, connected with the body during life, is separated from it at death. This may be asserted, but there is not one solitary fact to prove it: when the body dies, no more perception, no more memory, no more volition. So far as we can see, these die with the body, and exhibit no proof of their subsequent existence. These phenomena, are phenomena then of the body: if they be al-

*Feeling, Sensation, Consciousness, are the synonymous terms. T. C.

so phenomena of the Soul, then is the Soul also, like the body, material ; for it has properties in common.

(b) If it be said the Soul may exist after the body is dead and decomposed, I reply, the soul may also not exist : one supposition is as good as the other. Remember, it is not allowable in fair argument to take for granted the existence of a thing, merely because it may possibly exist. If you assert its existence, you must prove your assertion. *Affirmantis est probare. A posse ad esse, non valet consequentia.*

(c) If any one shall say these properties are only *suspended* for the time, I would desire him to examine what idea he annexes to this suspension ; whether it be any thing more or less than *they are made not to exist for the time*. Either no more is meant, or it is plainly opposed to matter of fact. Moreover if more *be* meant, it may easily be proved to involve the archetypal existence of abstract ideas ; to approach to the Platonic absurdities modified by the pre-established harmony of Leibnitz, which, I apprehend, will not be considered as defensible at this day. It can also be shewn that such ulterior meaning will contradict the maxim *impossibile est idem esse et non esse*. It will involve the grammatical absurdity of making a noun adjective stand by itself.

(d) If any one shall say farther, " These mental phenomena are not constituent parts, but acts of the soul, and evidences of its existence ; so that the soul may continue to exist when it no longer continues to act, or to act in this manner—that it does not follow that a man's power of working is annihilated because he has lost the tools or instruments with which he has usually worked."—I reply : 1. That whenever the evidences of the existence of a thing arise from the nature and structure of the thing itself, they are synonymous with its properties. Such are the phenomena of thinking with respect to the Soul : they are confessedly of its very essence. I cannot give a plainer illustration than I have already given ; let my reader, if he be a mineralogist, sit down and describe a mineral ; and then let him suppose all his characters annihilated. 2. As these intellectual phenomena are *all* the evidences we have of the Soul's existence, when these are destroyed or extinguished, so is the conclusion drawn from them. When all the evidences of the existence of *life* fail, no one scruples to say that life itself is gone. 3. The instruments with which a man usually works, are only a *small part of*, *not all* the evidences of his power of working. Were he to lose his senses, and his hands, and his powers of volition, and of voluntary motion, which are also conjoint evidences of his power of working, every one would say he had lost that power ; that is, it no longer existed. 4. It is equally legitimate to assert of gold, for instance, that what are termed its essential and characteristic properties are nothing more than acts and evidences of the existence of the substance gold, which *may* continue to ex-

ist, notwithstanding it no longer continues to exhibit any of those phenomena which are termed its properties, but are in fact only temporary evidences of its existence. Would any reasonable man acknowledge the justness of such an argument? 5. If this conclusion *a posse ad esse—a potentia ad actum*—from the remotest of all possibilities of existence, be allowed—then can any thing whatever be proved to exist in despite of all proof to the contrary. Would not a physician regard that man as a lunatic, who was seriously to say of a putrid dead body before them; “to be sure, none of the actions which are the evidences of life are exhibited at present, but life may exist notwithstanding?”

5.—(a) All relative terms imply the existence of their correlates: a man cannot be a father without having a child, a husband without a wife, &c. Hence when either of two relatives cease to exist, the other does so likewise.

(b) All those ideas which make up our idea of the Soul, or in other words, all those properties from whence we infer its existence, are relative; their correlates are ideas. Thus, there can be no *perception* without ideas to be perceived; no *recollection* without ideas to be remembered; no *judgment* without ideas to be compared; no *volition* without ideas of the object on which it is exerted.

(c) Locke has shewn that we have no innate ideas; that all our ideas are ideas of sensation or reflection; and that the ideas of reflection are no other than the operations of the mind on our ideas of sensation: that is, all our ideas proceed from, and are founded on the impressions made upon our senses. The doctrine of the ancient school was the same, *nil unquam fuit in intellectu, quod non prius erat in sensu*, including the internal as well as the external senses; which is not the less true for being acknowledged as true by the wisest men of antiquity.* I am aware of the “fa-

* That the best informed of *modern* writers hold the same doctrine, and that the whole phenomena termed mental are merely excitations of the nervous system perceived, I assert, on the authority of Cabanis, of Bichat, of Blumenbach, of Richerand, of Magendie; as well as Hartley, Darwin, Priestley, and Lawrence. The elementary works of Bichat, Richerand, Blumenbach, and Magendie, being usually read in all our medical schools, I subjoin the references.

See Bichat, *Phys. Res.* (Dr. Watkins' Edit. 1809. Philad.) p. 105, *prope finem*. Richerand, (Dr. Chapman's Edit. 1813, Philad.) p. 390—392 and p. 400. Blumenbach, (Dr. Caldwell's Edit. 1795, Philad.) p. 195 of Vol. 1. Magendie, (Dr. Revere's Edit. Baltim. 1822,) p. 102, 103.. Broussais' *sur l'irrit. et la Folie*, p. 448.

The reader will find that the best informed and most approved elementary writers on physiology adopt the Latin axiom in the text, verbatim, or in substance. So Haller, *Phys.* § 556, describes a sensation as an affection of the brain perceived. *Primæ Lineæ*, Edmb. 1767.

No man is qualified to write on metaphysics and the phenomena of in-

culties of the mind," the numberless brood of the Scotch metaphysicians. I cannot and will not condescend to reply to the dreadful nonsense on this subject assumed as true by Dr. Reid and Dr. Beattie, or to the shallow sophisms of Dr. Gregory, or the prolix pages of inanity of Dr. Dugald Stewart, or the ignorant hardihood of assertion of Dr. Barclay in his late inquiry. We are all before the public, and I am content. In the mean time, let the reader ask himself, how he could acquire ideas of vision without the eye and its apparatus—of odour without the nostrils—of taste without the papillæ on the tongue and palate, &c. Let him say what ideas a man could have, all whose senses were entirely wanting. This is enough.

In fact, people begin to doubt whether a man can by any possibility, receive satisfactory evidence of the existence of any thing whatever, not cognizable by any of the human senses.

(d) But if all our ideas proceed from impressions made on our senses, as these are entirely corporeal, we never could have attained ideas without the body; that is, there would have been none of the phenomena of perception, recollection, judgment, or volition without the body: that is, there would have been none of those phenomena of thinking from whence we deduce the existence of the Soul—none of the properties of the Soul, without the body: in other words, there would have been no Soul without the body. So that the commencement of the existence of the Soul depends on the commencement of the existence of the body. Such is matter of fact.

(e) But the Immaterialists say, the Soul is distinct from and independent of the body as to its existence: hence, it is both dependent and independent of the body: that is, it does not exist, for contradictions cannot co-exist.

tellekt, who is not well versed in physiology, a branch of knowledge in which the Scotch school of metaphysicians are sadly deficient.

I would not willingly include Dr. T. Brown in this tirade against his superficial and dogmatic predecessors. I agree with him, that power and causation are words only, and inseparable from the real and actual antecedents and consequents to which they relate: and that our belief of the invariable attendance of like consequents on like antecedents, under like circumstances, is rather intuitive than a process of reasoning. I much fear, however, he has not succeeded in obviating the difficulty of Hume's argument against miracles; for all that writer's argument applies to the introduction of new antecedents, the permanent character of the usual and natural course of phenomena; and the difficulty of establishing this introduction by testimony which remains just as before. Dr. Brown has substituted one form of defence for another, but he has not substantially altered the state of the case. Brown, however, is a clear sighted and able metaphysician, but of the Scotch school; whose characteristic is, a dreadful ignorance of all physiological facts.

T. C.

The Immortality, a parte ante, of the Soul being null, let us examine its Immortality a parte post.

6. (a) all impressions made on our senses can be traced up to the internal sentient extremity of the nerve impressed, and no further.

(b) When an impression has been made on our senses by means of external objects, we have the property of perceiving the effects of that impression at a distance of time, and after the original impression has ceased. This is *memory* and *recollection*. Hence, although all our ideas have been caused by impressions made on our senses originally, we may lose one or two of our senses, and yet remember the ideas which are the effect of the impressions formerly made on them.

(c) But ideas can no more be remembered without the nervous system, than they could have been caused originally without the senses. All this is plain matter of fact.

(d) At death, however, not only all our senses are destroyed, (the only sources of original ideas) but the nervous system itself is destroyed, which is the *sine qua non* to the existence of ideas already caused. At death, therefore, all our ideas of every kind are destroyed.

(e) But there can be none of the properties of the Soul without ideas: for these are relates and correlates; and if all the properties of the Soul are destroyed, the Soul itself is destroyed.

(f) Therefore, whatever may be the case during the life of the body, the Soul did not exist previous thereto, and is destroyed when that is destroyed.

(g) And when it is considered that many circumstances during the life of the body may totally destroy for a time all the properties of the Soul, the little of existence that remains is hardly worth contending for.

(h) But when it is further considered, that the natural immortality of the Soul is supposed a necessary consequence of its immateriality, it will be a necessary consequence that this immaterial soul does not exist at all.

6. If the Soul exist at all, it must exist somewhere, for it is impossible to frame to one's self an idea of any thing existing which exists no where, and yet whose operations are limited as to space.

(b) But if the Soul exist somewhere, by the terms it occupies space; and therefore is extended; and therefore has figure or shape, in common with matter.

(c) Moreover by the supposition of every Immaterialist (except Malbranche, Leibnitz, and Berkley) the Soul acts upon the body; that is upon matter. That is, it attracts and repels, and is attracted and repelled; for there is no conceivable affection of matter, but what is founded upon, and reducible to, attraction and re-

pulsion. If it be attracted and repelled, its re-action must be attraction and repulsion. This implies solidity.

(d) The Soul then possesses extension, figure, solidity, attraction, repulsion. But these comprise all the properties by which matter is characterized, and the Soul therefore, whatever else it be, is a material being.

(e) But it cannot be both material and immaterial at the same time, and therefore it does not exist.

7. Those truths which we derive from the evidence of our senses, carefully observed and sufficiently repeated, are more weighty than such as are mere deductions of reason and argument. If I feel that by beating a large stone with my fist I shall hurt my knuckles, I cannot doubt of that after a sufficient number of trials. If I find that a large quantity of strong wine will render me intoxicated, I cannot disbelieve the result of experience. I see that the mental phenomena are in fact connected with the organization of the human body, by means of the nervous apparatus which is a part of it. I know by observation and experience, that if you destroy that part of the nervous system which supplies any one of the organs of sense, as the optic nerve of the eye, the organs of that sense no longer supply me with the same feelings as before. All this is matter of fact, ascertainable in the same way that we ascertain the effect of a bottle of Madeira; by the use of our senses. About all this we can no more doubt, than about our existence. But what evidence can we possibly have of the existence of the Soul. It is not cognizable by any of our senses—by any of the common inlets of knowledge—it is, by the hypothesis, immaterial, it hath no relation to matter. By the very nature of it, we can have no sensible proof of its existence. It is an hypothesis, a supposed being, introduced to account for appearances manifestly connected with our bodily organs, which so far as we know, cannot take place without them, whether there be a soul or not. This connexion we see, hear, feel, and know to exist, though we do not exactly know how to trace it. But the Soul has no existence for our senses—it is a being whose existence is assumed because the present state of knowledge does not enable us (perhaps) to account for the precise mode of connexion between intelligence and our nervous system. I shall by and by shew, that we are just as much at a loss to account for the growth of a blade of grass, or the life of a tree, as for the reasoning of an animal.

But let the reader reflect for a moment, and ask himself if this hypothetical introduction of an immaterial soul to solve the difficulties that our inevitable ignorance produces, be not a manifest breach of the acknowledged axiom, *a posse ad esse non valet consequentia*? A mere refuge for present ignorance of a connexion which future knowledge may or may not unravel.

A THEORY explains unknown facts by the laws and properties of

known facts. Newton applied the cause which makes a stone fall to the earth to the tendency of the planets toward the sun. Here was nothing new assumed to aid the reasoning. Had he said that as it was impossible to explain the tendency of the planets toward the sun, by any properties of the planets or the sun, and therefore it must be owing to some angel whose duty it was to impel the planets in their proper direction, this would have been *HYPOTHESES*: just like our notions of the Soul to account for the phenomena of the body.

So that we not only have no direct and satisfactory evidence of the existence of the Soul, and from the presumed nature of it never can have, but the clear, direct, undeniable evidence of our senses is all the other way.

Is it not singular, moreover, that we cannot talk about this immaterial soul, its existence, its properties, its mode of action, but in language suggested by and borrowed from the bodily senses? Can we think or speak of immaterial beings in any other words or expressions than those which our senses have suggested to us, and which belong to our corporeal senses alone?

"I see" (says Mr. Hallet, in his discourses) "a man move, and hear him speak for some years. From his speech, I certainly infer that he *thinks* as I do. I see, then, that a man is a being who thinks and acts. After some time, the man falls down in my sight, grows cold and stiff. He speaks and acts no more. As the only reason I had to believe that he did think, was his motion and speech, so now that they cease, I have lost the only way I had of proving that he had the power of thought. Upon this sudden death, the one visible thing, the one man, is greatly changed. Whence could I infer that the same *he* consists of two parts, and that the inward part continues to live and think, and flies away from the body, while the outward part ceases to live and move? It looks as if the *whole man* was gone, and that all his powers cease at the same time. So far as I can discern, his motion and thought die together.

"The powers of thought, speech, and motion equally depend on the body, and run the same fate in case of men's declining old age. When a man dies through old age, I see his powers of motion and thought decay and die together, and each of them by degrees:* the moment he ceases to move and breathe, he appears to cease to think too.

"When I am left to mere reason, it seems to me, that my power of thought depends as much on my body, as my power of sight and hearing. I could not think in infancy. My powers of thought, of sight, and of feeling are equally liable to be obstructed by the body. A blow on the head has deprived a man of thought, who could yet see, and feel, and move. So that naturally the power of thinking seems to

* The reader will recollect Gil Blas' Archbishop of Toledo.

belong as much to the body, as any power of men whatsoever. Naturally there appears no more reason to suppose a man can *think* out of the body than that he can hear sounds or feel cold out of the body."

If this be the case (which cannot be denied)—if there neither be in fact, nor from the nature of the thing ever can be, any direct evidence for the existence of an immaterial, distinct, independent soul—still further, if all the direct and positive evidence that there can be of any thing whatever, all that the present case can in the nature of it admit, is *against* the existence of such a soul—how strong, how absolutely irrefragable, how evident ought that reasoning to be, by which its existence is inferred! Even the possibility of its being fairly and honestly disputed, is a strong presumption against its conclusiveness. Who can fairly and honestly dispute the dependence of thought on the body?

8. I apprehend all the phenomena termed mental or intellectual, are explicable as phenomena of the body. Hartley, and Des- tut Tracey, the one in his first volume on Man, and the other in his *Ideologie*, have done it to my satisfaction. I cannot enter into their reasonings; they must speak for themselves. The public by and by will give to these authors that fair play which the orthodoxy of the moment will not concede to them.

9. We have not the slightest proof of any kind, that ideas can arise or can exist independently of corporeal organization. We have never known them so to exist. We know not, nor have we from facts the slightest reason to believe that they can. But the Soul itself has been invented to account for them. They are (by those who believe in a separate Soul) considered as essential to that being—the peculiar property and result of the Soul's operations. But where is the proof that ideas can exist in the Soul without the body? Where is thought when the body dies? Where was thought before the body began to exist? *De non apparentibus et non existentibus eadem est ratio.* All assertions are equally true concerning that which doth not exist, and that of whose existence there is no evidence.

Such are the arguments of an abstract and metaphysical nature, on which I ground my opinion that an immaterial, immortal Soul, separate from the body, does not and cannot exist: and it appears to me, from what has been said, that there is the same proof for the truth of the doctrine of *Materialism*, as that gold is heavy, ink black, water fluid, or any other indubitable assertion. Also, that there is the same proof that the opposite doctrine *cannot* be true, as that contradictory assertions cannot be both true.

I come now to a class of arguments that assume a physiological rather than a metaphysical character. But before I enter upon this branch of the subject, I beg leave to state some physiological propositions relating to the animal system, that bear upon the subject in question.

The objects around us have been conveniently classed into the mineral, vegetable, and animal kingdoms. The particles of the bodies whereof each kind of substance is composed, have peculiar active properties; by which they arrange themselves, when free from the obstacle of pressure by foreign bodies, into some peculiar form.

The particles of a *mineral* substance, when they have full time and room to arrange themselves according to their respective propensities, assume certain figures, usually prismatic; of which the number of sides, and size of the angles, are determined within certain limits by the chemical constitution of the mineral in question. Hence, the determination of mineralogical species, has within these twenty years, been made to rest on the form of a crystal, particularly by all the mineralogists of the French school. The general fact is indubitable; but the limitations and the precise relations between chemical composition and the figure of the mineral nucleus, have not yet been accurately determined.

Minerals increase in size by the crystallization of adventitious particles round a crystallized nucleus, producing secondary forms; but they do not devour, decompose, digest, assimilate, secrete, excrete, grow, and propagate. They do not seem to have any property to which the term *life* can fairly be applied, or to suffer any thing like what we call *death*; although it is impossible to doubt that they are endowed with active properties.* Like all other substances, they are liable to chemical decomposition, and consequent disintegration. They are utterly devoid of sensation and volition; and have no apparatus connecting them with surrounding bodies.

Vegetables are substances that have a peculiar organization or arrangement of solid, tubular, cellular, and fluid parts: by means of which they feed, digest, assimilate, secrete, excrete, grow, and propagate their kind. They die of violence, of disease, of old age. They are not locomotive, being fixed by their roots. No nervous apparatus has hitherto been discovered in them; but certain of their fibres are irritable and contractile. Having no nervous apparatus, they have no perception (sensation) or volition; they do not think. No vegetable has hitherto been clearly ascertained to appear, but as the offspring of a former vegetable: and though, by process of assimilation, inorganic and lifeless matter is converted into organic and living matter, the vegetable life (so far as we know) must pre-exist. The chief use of vegetables seems to be the furnishing of food for animals, and partially preparing lifeless and inorganic matter to become sentient and capable of pain and pleasure. With the exception of less than one part by weight in a thousand, vegetables are resolvable into carbon, hydrogen, oxy-

* Crystallization, chemical affinity, polarity of light, electrical, and magnetic attractions and repulsions, are all active properties. T. C.

gen, with a small portion of nitrogen, potassium, and phosphorus. The earths found in them do not seem to be essential to their composition.

Animals are substances that have a peculiar organization or arrangement of solid, tubular, cellular, and fluid parts; by means whereof, they devour, digest, assimilate, grow, secrete, excrete and propagate. They die of violence, of disease, of old age. When dead, they are decomposed into azote or nitrogen, carbon, hydrogen, oxygen, lime, and phosphorus. They are locomotive. They have a muscular apparatus for that purpose; and they have a nervous apparatus for the purposes of sensation and volition, by which they are connected with surrounding objects, animate and inanimate. By assimilation, they convert inorganic and lifeless into organic, living, and sentient matter.* It has not yet been clearly shewn, that any animal has arisen unless as successor to some similar animal, his immediate progenitor. The *nisus formativus* of Blumenbach, the theories of Darwin, and La Marck, are not impossible, but have as yet few converts. The doctrine of equivocal generation *seems* to have the weight of fact against it. The Zoophytic animals, the animalculæ infusoriæ, the worms and other parasites that prey on the internal parts of living animals, form difficulties, but perhaps no exceptions; just as the vegetable efflorescences, the mosses, the *conservæ*, and other minute vegetations do in Phytology.

Every vertebrous animal has (*a*) an organic system destined to support the mere life of the animal, and which is analogous to the organic system of a vegetable: (*b*) a muscular system destined in part for internal action, in part for locomotion; (*c*) a nervous system, in part subservient peculiarly to sensation and volition, and our relations to other beings.

The involuntary muscles possess, by means of secretion supplied by the organic system and the nervous apparatus appropriated to it, a power of contraction, or of becoming thicker and shorter, on the application of stimulus. Stimulus may be either the natural stimulus of the nervous system, or of the blood, or it may be artificial. The actions of the involuntary muscles go on, without being felt or perceived. The voluntary muscles are stimulated naturally by that portion of the nervous system which is appropriated to sensation and volition, viz, by the brain and cerebral innervation: one part or fibre of a nervous fasciculus transmitting innervation to, and another from the brain. Galvanic processes have to a certain degree been found a substitute for the nervous stimulus of the muscles, voluntary and involuntary.

It has been ascertained, that the muscular power resides in the muscles, and is a property of the muscular fibre, and is distinct

* How this is done, we know not, and perhaps never shall know. But the fact is not less a fact because we cannot explain it. T. C.

from the nervous power which acts merely as one of the stimuli to muscular irritability. Muscular irritability and contractility may exist in a separated muscle. It has been ascertained that the nervous power destined to the purposes of involuntary, insentient, organic life, is distinct from the nervous power destined to the purposes of sensation and volition; for each can be shewn separate from the other. It has been made highly probable, that the first mentioned portion of the nervous system is confined to the medulla oblongata and the ganglionic plexuses: the latter and more important portion, to the brain as its centre.

I am aware of my friend Dr. Ferriar's collection of cases in the Manchester transactions, in a letter to myself; of Sir Everard Home's collection of cases in the Philosophical Transactions; and of many other cases not included in the papers of these gentlemen, where lesions of the brain have occurred without much apparent injury to intellect. No physiologist regards them as weighing a feather against the supposition of the brain being the centre of the nervous system appropriated to sensation and volition: for we do not yet know, by experiment, what portions of the brain are exclusively so; nor is a general fact established by induction of innumerable particulars, to be set aside, on account of a few apparent anomalies of difficult explanation. The theory comprises those parts of the brain that *are* essential to sensation and volition; and not the more bulky mass which appears merely as a subservient envelope. The experiments of Sir Everard Home on the connexion of memory with the cortical substance, and the more important "Researches" of M. Flourens, promise to throw light on this difficult subject, which only requires patient and pursued investigation. Some internal sentient extremity there must be to each main branch of the nerves of the senses. In relation to the present inquiry, place it where you please, or where the best settled facts point out.

The above views that I have taken of the mineral, vegetable, and animal economy, I offer to the reader not as any deductions of theory, but as expressions of separated and ascertained fact, which a well read modern physiologist will hardly venture to gainsay, under the limitations I have used in stating them. I refer to Bichat, Richerand, Magendie, Dr. Wilson Philips, Sir Everard Home, and the Physical Researches of M. Flourens in p. 299 of vol. xx. of Ann. de Chim.

I proceed to my *second class* of arguments.

1. The propensity of the minute particles of quartz to unite together in a six-sided prism terminated by six-sided pyramids—of the zirconite to assume a tetrahedral prism terminated by tetrahedral pyramids—of the diamond and garnet to appear as dodecahedrons—of pyrites as a cube—of carbonate of lime as a rhomboid, &c. &c. so that their particles seek out an union with adjacent particles, not indiscriminate and promiscuous, but in the peculiar

manner proper to form these figures—is either a property of the material particles themselves, or it is owing to some separate being or principle who impresses on the particles the necessary force in the necessary direction on each occasion. No one hitherto, however, has thought of ascribing this propensity but to some property belonging and essential to the particles themselves.

The arrangement of the nutritious matter taken in by a vegetable, in the peculiar form which that vegetable affects, and by which it is characterized, has usually been attributed to the effect of vegetable life as connected with vegetable organization. No one hitherto has advanced the hypothesis of a vegetable soul—distinct from the plant, but regulating and governing it—a being superior to, and surviving, the vegetable. Yet there is no more difficulty in supposing perception a property of a nervous system, or christallization of a mineral system. We see them all, like other properties, intimately and essentially connected, as antecedents and consequents, with the subject to which they are referred; and we refer them accordingly, as in all other cases of similar connexion. How is life of any kind the result of mere matter and motion? Yet the fact is undeniable. Does it not exist by stimulation?

We see in the human frame a nervous apparatus that is essentially connected with sensation and volition, and from which these properties arise—that serves no other purpose than to give birth to them—we see them in infancy in a state approaching to non-entity; forming gradually and slowly; growing with the growth of the being to which they belong, and improving by degrees—we see them vary in kind and intensity according to our education and the nature of the society in which we are thrown—we see them dependent for almost all their characters on the manner in which that part of the nervous system is excited *ab extra*; so that a man born and educated in Constantinople will have one set of impressions and associations, one habit of sensation and volition, and a man with a similar arrangement of nervous apparatus born and educated among the Quakers at Philadelphia will have another. All this is the result of generating causes extraneous to system—owing to specific peculiarities of excitement that causes the nervous apparatus to act in this manner rather than in that, and to assume different habits. I say, we see all this to be in every case, undeniable matter of fact. How then can we deny sensation and volition to be the result of the stimulated nervous system? There is the same connexion of phenomena, the same uniform result of that connexion, presenting no more difficulty in the case of sensation and volition, than in the case of glandular secretion; or animal heat; or muscular motion; or sanguification; or the secretion of resin in the pine, and sugar in the maple from the same introsuscepted fluid. All the processes are equally inexplicable from any *a priori* arrangement of matter and motion known

to us ; all of them stand in equal need for explanation of an immaterial principle ; for although we see clearly that these are the phenomena of an organized matter in each case, yet in no case can we explain the rationale by any of the known properties of other inorganized matter. Hence according to the psychological doctrines, we must resort to some distinct and superadded being ; to the anima intellectualis ; the anima sensitiva, and the anima vitalis of the ancients—or to the separate faculties of the Scotch school of metaphysics, a species of entities most accomodating, ready for all work, and always in waiting—or to some being of analogous existence to the immaterial Soul of the orthodox. For I assert, and appeal to matter of fact, that,

There is exactly the same evidence that sensation or perception, and volition, are properties of the nervous apparatus of the human system, that there is of contractility being a property of muscular fibre, or sight the property of the eye.

On the truth of this proposition, I should (were it necessary) be willing to rest the controversy. In the one case and the other, constant concomitance is the sole foundation for ascribing necessary connexion. If it be sufficient in any one of the cases, it is sufficient in all. It is not necessary that we should be able to explain the quomodo : it is enough that our senses, under careful observation, assure us of the fact. Future facts and the future improvement of the human intellect may enable our posterity to do that which our more imperfect knowledge will not enable us to accomplish : just as the present generation are able to explain what remained an enigma to their forefathers.

2. I have said above, that our perception, volition, and in fact our other intellectual faculties, begin from nothing in infancy, grow with our growth, improve with our experience, vary with our education, and differ, not merely as to the nervous systems excited, but in consequence of the habitual difference in the stimuli applied. Suppose the original intellect of two infants exactly the same ; educate the one among the thieves of broad St. Giles in London, and the other among the best class of Philadelphian Quakers, would their intellect be the same at one and twenty ? But is the soul thus mouldable and changeable ? Is the Soul infantile as well as the body ?

3. If the intellectual phenomena depended entirely on the soul, then we should be unable to produce, annihilate, alter, or modify them by any mere mode of action operating merely on the body. But

Our ideas are frequently produced and commonly modified by the internal state of our bodily organs, particularly of the internal viscera—and by the state and condition of our organic life : hence the phenomena of dreaming, of delirium, and the hallucinations of hypochondria ; and the alterations produced in our sensations and ideas by our state of internal health. Our ideas also are pro-

duced and modified by substances exhibited to us acting medicinally; as by wine, by opium, by cantharides, &c. But as Judge Cooper has said in his Medical Jurisprudence, how can you exhibit a dose of glauber salts to the Soul?

If then sensations, ideas, reasonings, and volitions are produced, modified or extinguished, by the condition of the involuntary parts of our organic system—by disease—by medicine: if they be (as we know they are) greatly under the command of the physician who acts only on the body—are not these effects thus produced by means of the body, bodily effects? What has the Soul to do with them? Are not these effects, however, the only evidences of the Soul's existence—the essential, incommunicable properties of the Soul, according to the Immaterialists? Yet are they manifestly produced on the body; and so far as we can see, on the body alone, by means of material stimuli calculated to act solely on the body?

If it be said, the body is no more than the instrument of the Soul, which can only act according to the condition of that body with which it is connected, and when the body is altered, the intellectual phenomena which it is calculated to exhibit, are altered also—then it follows, from the evidences of what takes place, that the very nature of the Soul is altered by altering the condition of the body, and the Soul therefore is under the control of accident, of disease, of medicine, and may be just what a physician chooses to make it. For if a physician can control the intellectual phenomena of sensation, memory, judgment, and volition, (as he can) then are all the *essential* properties of the Soul itself subject to the articles of the *Materia Medica*, and slaves of the *Pharmacopœia*.

4. I have already said, that no phenomena of mere matter and motion—no principle of mechanical or chemical philosophy can account for the phenomena of life and stimulus—for digestion, assimilation, secretion, reproduction. These are just as difficult as sensation, memory, or volition: the interposition of an immaterial Soul is as necessary to vegetable life, as to the human faculties. If this be denied, shew me where and by whom they have been explained, or explain them if you can.

5. I appeal to any physician accustomed to cases of insanity; and I ask whether all the intellectual appearances in that disease are not manifestly the result of the morbid state of the bodily organs? Is not this the case from the most violent symptoms of mania, to that almost imperceptible obliquity, from which in some degree or other, hardly any of us are free? In fact, such as is the state of our system, such are the mental phenomena we exhibit; the latter are the result of the former. Can you put a male mind into a female body, or vice versa? Let a parent decide this question; he will answer at once, No. Can you put an old head on young shoulders? No.

If a morbid intellect be the result of a morbid state of the encephalon, then is a sane intellect the result of a sane state, for like reason : and the intellect is what the encephalon is.

6. But there are no mental phenomena exhibited by the human species that are not also exhibited by the brute species. The difference is concomitant with difference of organization. The superiority of the human being arises from his larger, more expanded, and more perfect cerebral apparatus ; from his erect position ; from the skill with which he can use his hands ; and from the faculty of speech. These give rise to the manipulations of art, and to the preservation and propagation of knowledge. For want of these, one generation of brutes is little wiser than the preceding. There is with them no means of accumulating knowledge.

When a dog has lost his master, does he not seek him at the places his master has been accustomed to frequent ? I know by oft repeated facts in my own case, that he does. Does not this imply memory, ratiocination, volition ? So many volumes of instances of the sagacity of animals, particularly of the canine species, have been collected, and instances are so familiar, that I would not condescend to argue with a man who would have hardihood enough to deny it. All these are intellectual phenomena *of the same kind* with such as we exhibit ; the difference is in complication and degree only. They are evidences therefore of an immaterial, immortal, distinct Soul, producing them. What say you to the immortal Soul of an opossum or an oyster ?

I see no possibility of denying the facts, or avoiding the conclusions ; and I leave the difficulty to be overcome by those who choose voluntarily to encounter it.

Finally, I say, that the phenomena termed mental, have been so well explained by Hartley, Cabanis, and Destut Tracey, that no man conversant with their writings, can hesitate to allow this. I say it is not possible for a fair man, conversant with physiology, to deny, that a sensation from recent impression, and an idea from recollection, are motions in the brain (or common sensory) perceived. As all our intellectual phenomena consist of sensations or ideas, which are the materials and substrata of memory, judgment, and volition, all of them consist in motions communicated to the corporeal nervous system—to the common sensory ; whether by external impression, by association, or by internal sympathetic action, (innervation.) They are, therefore, corporeal phenomena, and no more. Destut Tracey has shewn this so clearly, and so well explained the phenomena of memory, judgment, desire, volition, as mere names given to various states and conditions of our brain, that I do not expect any refutation will or can be given to the view of the subject he has taken. Orthodox Ontology is in the seat of authority now, but truth will prevail at last.

In speaking of the brain as the common sensory, I speak according to the language of physiologists of repute, who seem not to be shaken by the anomalous cases to the contrary. Ferriar's collection is good for little, because his authorities are sometimes deficient in accuracy of observation, and sometimes in credibility. Neurology in his day, was very deficient, and still more so in the days of the authors he relies on. But whether the internal sentient extremities of the sensorial nerves terminate in the brain or elsewhere, is of no moment whatever to the argument; they must terminate somewhere; and where they do terminate, is, for my purpose equivalent to the brain; and this word may be used for the sensorium, wherever that may be.

In arranging the preceding arguments, facts are repeated; but the point of view in which they are placed, authorizes me as I have thought, to distribute them under distinct heads.

I know the obloquy to which Mr. Lawrence, the surgeon, has been exposed, in consequence of his having advanced the opinion of the materiality of the Soul, or rather the singleness of human nature as consisting of the organized body only; but the obloquy that results from clerical persecution, popular bigotry, and professional jealousy, cannot detract from the reasoning of a man on all hands confessed to be among the most able and best informed anatomists and physiologists of the day. I give, therefore, the following extract copied with some few omissions and unimportant alterations from his lecture on the *Functions of the Brain*. Mr. Lawrence's book has been widely disseminated in England; but it is comparatively unknown in the United States; for not one bookseller in the Union is hardy enough to publish it!* Such is the state of the press in this country of boasted freedom, and such the tyranny exercised by the orthodox clergy over the minds of the people! A tyranny that I have a right to exclaim against, because I feel it, and have felt it.

"There would be little inducement to compare together the various animal structures, to follow any apparatus through the whole animal series, unless the structure were a measure and criterion of the function. Just in the same proportion as organization is reduced, life is reduced: exactly as the organic parts are diminished in number and simplified, the vital phenomena become fewer and more simple; and each function ends when the respective organ ceases. This is true throughout zoology: there is no exception in behalf of any vital manifestations.

"The same kind of facts, the same reasoning, the same sort of evidence altogether, which shew digestion to be the function of the alimentary canal, motion to be the function of the muscles, the various secretions of their respective glands—prove that sensation, perception, memory, judgment, reasoning, thought, in a word, all

* It has been published since. T. C.

the manifestations called mental or intellectual, are the animal functions of their appropriate organic apparatus, the central organ of the nervous system. No difficulty or obscurity attends the latter case, which does not equally affect all the former instances: no kind of evidence connects the living process with the material instruments in the one, which does not apply just as clearly and forcibly to the other.

“Shall I be told that thought is inconsistent with matter; that we cannot conceive how medullary substance can perceive, remember, judge, reason? I acknowledge we are entirely ignorant *how* the parts of the brain accomplish these purposes; we know only the fact: we are equally ignorant how the liver secretes bile, how the muscles contract, or how any other living purpose is effected: and so we are how heavy bodies are attracted to the earth, how iron is drawn to the magnet, or how two salts decompose each other. Experience is, in all these cases, our sole, if not sufficient instructress, and the constant conjunction of phenomena, as exhibited in her lessons, is the sole ground for affirming a necessary connexion between them. If we go beyond this, and come to inquire the manner *how*—and attempt to discover the mechanism by which these things are effected, we shall find every thing around us equally mysterious, equally incomprehensible: from the stone which falls to the earth, to the comet traversing the heavens—from the thread attracted by amber or sealing wax, to the revolutions of planets in their orbits—from the formation of a mite in cheese, or a maggot in putrid flesh, to the production of a NEWTON or a FRANKLIN.

“In opposition to these views, it has been contended, that thought is not an act of the brain, but of an *immaterial* substance, residing in, or connected with it. This large and curious structure, which, in the human subject, receives one-fifth of all the blood sent out from the heart; which is so delicately and peculiarly organized, so nicely enveloped in successive membranes, and securely lodged in a solid bony case, is by this supposition left almost without an office: being barely allowed to be capable of sensation. It has, indeed, under this hypothesis, the easiest lot in the animal economy; it is better fed, clothed, and lodged, than any other part, and has less to do. But its office (only one remove from a sinecure) is not a very honorable one: it is a kind of porter, instructed to open the door, and introduce new comers to the master of the house, who takes on himself the entire charge of receiving, entertaining, and employing them.

“Let us survey the natural history of the human mind—its rise, progress, various fates, and decay—and then judge whether these accord best with the hypothesis of an immaterial agent, or with the plain dictates of common sense, and the obvious analogy of every other organ and function, throughout the boundless extent of living beings.

“But you must bring to this physiological question, a sincere and earnest love of truth: dismissing from your minds all the prejudices and alarms which have been so industriously connected with it. If you enter on this inquiry in the spirit of the bigot and the partisan—suffering a cloud of fears and hopes, desires and aversions, to hang round your understandings, you will never discern objects clearly; their colors, shapes, and dimensions, will be confused, distorted, and obscured by the intellectual mist. Our business is to inquire what is true, not which is the finest theory—not what will supply the best topics of pretty composition and elegant declamation addressed to the prejudices, passions, and ignorance of our hearers. We need not fear the result of investigation: reason and free inquiry are the only effectual antidotes of error. Give them full scope, and they will uphold the truth, by bringing false opinions, and all the spurious offspring of ignorance, prejudice, and self-interest, before their severe tribunal, and subjecting them to the test of close examination. Error alone needs artificial support; truth can stand by itself.

“Sir *Everard Home*, with the assistance of Mr. *Bauer* and his microscope, has shewn us a man eight days old, from the time of conception; about as broad and a little longer than a pin’s head. He satisfied himself that the brain of this homunculus was discernible. Could the immaterial mind have been connected with it at this time? Or was the tenement too small even for so ethereal a lodger? Even at the full period of utero-gestation, it is still difficult to trace any vestiges of mind; and the believers in its separate existence have left us quite in the dark on the precise time when they suppose this union of soul and body to take place. Some endeavor to account for the entire absence of mental phenomena at the time of birth by the senses and brain *not having been yet called into action*, by the impressions of external objects. The senses and brain begin to be exercised as soon as the child is born; and a faint glimmering of mind is dimly perceived in the course of the first months of existence; but it is as weak and infantile as the body.

“As the senses acquire their powers, and the cerebral mass becomes firmer, the mind gradually strengthens, advances slowly with the body through childhood to puberty, and becomes adult when the development of the frame is complete; it is, moreover, male and female, according to the sex of the body. (The propensities, the modes of thinking and acting, are manifestly influenced by sex.) In the perfect period of organization, the mind is seen in the plenitude of its powers; but this state of full vigor is short in duration, both for the intellect and the corporeal fabric. The wear and tear of the latter is evidenced in its mental movements: with the decline of organization the mind decays; it becomes decrepit with the body; and both the one and the other are, at the same moment, extinguished by death.

"What can we infer from this succession of phenomena? The existence and action of a principle entirely distinct from the body? Or a close analogy to the history of all other organs and functions?"

"The number and kind of the intellectual phenomena in different animals, appear to correspond closely to the degree of development of the brain. The mind (mental or intellectual faculties) of the Negro, Hottentot, Calmuck, and Carib, is inferior to that of the European; and their organization also is less perfect. The large cranium and high forehead of the ourang-outang lift him above his brother monkeys; but the development of his cerebral hemispheres, and his mental manifestations, are both equally below those of the Negro. The gradation of organization and of mind passes through the monkey, dog, elephant, horse, to other quadrupeds: thence to birds, reptiles, and fishes; and so on to the lowest links of the animal chain.*

"In ascending these steps of one ladder, following in regular succession at equal intervals, where shall we find the boundary of unassisted organization? Where place the beginning of the immaterial principle called in aid? In that view which assimilates the functions of the brain to those of other organic parts, this case has no difficulty. As the structure of the brain is more exquisite, perfect, and complex, its functions ought to be proportionally so. It is no slight proof of the doctrine now enforced, that the fact is actually thus: that the mental powers of brutes, so far as we can see, are proportional to their organization.

"We cannot deny to animals all participation in rational endowments, without shutting our eyes to the most obvious facts; to indications of reasoning which the unprejudiced observation of mankind has not failed to recognize and appreciate. Without adverting to the well known instances of comparison, judgment, and sagacity in the elephant, the dog, and many other animals, let us read the character drawn by *Humboldt*, of the South-American mules: 'When the mules feel themselves in danger, they stop, turning their heads to the right and to the left. The motion of their ears seems to indicate that they reflect on the decision they ought to take. Their resolution is slow, but always just, if it be free; that is to say, if it be not crossed or hastened by the imprudence of the traveller. It is on the frightful roads of the Andes, during journies of six or seven months, across mountains furrowed by torrents, that the intelligence of horses and beasts of burthen displays itself in an astonishing manner. Thus the mountaineers are heard to say, 'I will not give you the mule whose step is the easiest, but him who reasons best.' 5 Pers. Narr. 111. If the

* This is well illustrated, so far as the facial angle is concerned, in the plate at the beginning of Mr. White of Manchester's Essay on the Gradations of Man. His plate is taken from Camper and Blumenbach. Lawrence's plates also are from the same sources. T.C.

intellectual phenomena of man require an immaterial principle superadded to the brain, we must equally concede it to those more rational animals which exhibit manifestations differing from some of the human only in degree. If we grant it to these, we cannot refuse it to the next in order, and so on in succession to the whole series; to the oyster, the sea anemone, the polype, the microscopic animalcules. Is any one prepared to admit the existence of immaterial principles in all these cases? If not, he must equally reject it in man.

"It is admitted that an idiot with a mal-formed brain, has no mind: that the sagacious dog, and half reasonable elephant do not require any thing to be superadded to their brains: it is admitted that a dog or elephant excels inferior animals, in consequence of possessing a more perfect cerebral structure; it is strongly suspected that a NEWTON and a SHAKSPEARE excelled other mortals only by a more ample developement of the anterior cerebral lobes; by having an extra inch of brain in the right place;* yet the Immaterialists will not concede the obvious corollary of all these admissions, viz. that the mind of man is merely that more perfect exhibition of mental phenomena which the more complete development of the brain would lead us to expect; but they still perplex us with the gratuitous difficulty of their immaterial hypothesis. Thought, it is positively and dogmatically asserted, cannot be an act of matter. Yet no feeling, no thought, no intellectual operation, has ever been seen but in conjunction with a brain; and living matter is acknowledged by most persons to be capable of what makes the nearest possible approach to thinking. The strongest advocate for Immaterialism seeks no further than the body for his explanation of all the vital processes of muscular contraction, nutrition, secretion, &c. operations quite as different from any affection of inorganic substance, as reasoning or thought: he will even allow the brain to be capable of sensation.

"Who knows the capabilities of matter so perfectly, as to be able to say, that it can see, hear, smell, taste, and feel, but cannot possibly reflect, imagine, judge? Who has appreciated them so exactly, as to be able to decide that it can execute the mental functions of a dog, an elephant, or an ourang-outang, but cannot perform those of a Negro or a Hottentot? To say of a thing known only by negative properties, that is, an immaterial substance, which is neither evidenced by any direct testimony, nor by any indirect proof from its effects, that it does exist and can think, is quite con-

* I do not think with, Mr. Lawrence, that the mere size of the brain is alone sufficient to account for difference of intellect: the greater or less irritability of the whole nervous system—the aptness of the nervous system to admit associations—the facility with which ideas of former impressions are called up by association—the greater permanence and more extensive associations of particular classes of impressions and ideas, &c. &c. are probably powerful sources of difference.

sistent in those who deny thought to animal structures, where we see it going on every day !

"If the mental processes do not constitute the function of the brain, what is its office ? In animals which possess only a small part of the human cerebral structure, sensation exists, and in many cases is more acute than in man : what employment shall we find for all that man possesses over and above this portion—for the large and prodigiously developed human hemispheres ? Are we to believe that these serve only to round the figure of the organ, or to fill the cranium ?

"It is necessary for you to form clear opinions on this subject, as it has a direct and immediate reference to an important branch of pathology. They who consider the mental operations as acts of an immaterial being, and thus disconnect the sound state of the mind from organization, act very consistently in disjoining insanity also from corporeal structure, and in representing it as a disease not of the brain, but of the mind (or Soul.) Thus we come to a disease of an immaterial being ! for which, suitably enough, moral treatment has been recommended.

"I firmly believe, on the contrary, that the various forms of insanity—all the affections comprehended under the general term, mental derangement—are no other than evidences of cerebral affections. They are disordered manifestations of those organs whose healthy action produces the phenomena called mental ; they are, in short, symptoms of a diseased brain. These symptoms have the same relation to the brain, as vomiting, indigestion, heart burn, to the stomach ; cough, asthma, to the lungs ; or any other deranged functions to their correspondent organs.

"If the biliary secretion be increased, diminished, suspended, or altered, we have no hesitation in referring it to changes in the condition of the liver as the immediate cause of the phenomena. We explain the state of respiration, whether slow, hurried, impeded by cough, spasm, &c. by the various conditions of the lungs and other parts concerned in breathing. These explanations are deemed perfectly satisfactory.

"What should we think of a person who told us that the organs had nothing to do with the business : that cholera, jaundice, hepatitis, are diseases of an immaterial hepatic being ; that asthma, cough, consumption, are affections of a subtle pulmonary matter ; or that, in each case, the disorder is not in the bodily organs, but in a vital principle ? If such a statement should be deemed too absurd for any serious comment in the derangements of the liver, lungs, and other organic parts, how can it be received in the brain ?

"The very persons who use this language of diseases of the mind, speak and reason correctly respecting the other affections of the brain. When it is compressed by a piece of bone, or by effused blood or serum, and when all intellectual phenomena are

more or less completely suspended, they do not say that the mind is squeezed—that the immaterial principle suffers pressure. For the ravings of delirium and frenzy, the excitation and subsequent stupor of intoxication, they find an adequate explanation in the state of the cerebral circulation, without fancying that the mind is delirious, mad, or drunk. In these cases, the seat of the disease, the cause of the symptoms, is too obvious to escape notice. In many forms of insanity, the affection of the cerebral organization is less strongly marked, slower in its progress, but generally very recognisable, and abundantly sufficient to explain the diseased manifestations;—to afford a material organic cause for the phenomena—for the augmented or diminished energy, or the altered nature of the various feelings and intellectual faculties.

“I have examined, after death, the heads of many insane persons, and have hardly seen a single brain which did not exhibit obvious marks of disease. In recent cases, loaded vessels, increased serous secretions : in all instances of longer duration, unequivocal signs of present or past increased action ; blood vessels apparently more numerous, membranes thickened and opaque ; depositions of coagulable lymph forming adhesions or adventitious membranes ; watery effusions ; even abscesses. Add to this, that the insane often become paralytic, or are cut off by apoplexy.

“Sometimes, indeed, the mental phenomena are disturbed without any visible deviation from the healthy structure of the brain ; as digestion or biliary secretion may be impaired or altered, without any recognisable change of structure in the stomach or liver. The brain, like other parts of this complicated machine, may be diseased sympathetically ;* and we see it recover. Thus we find the brain, like, like other parts, subject to what is called functional disorder ; but although we cannot absolutely demonstrate the fact, we no more doubt that the material cause of the symptoms or external signs of disease is in this organ, than we do that impaired biliary secretion has its source in the liver, or faulty digestion in the stomach. The brain does not often come under the inspection of the anatomist in such cases of functional disorder ;

* As in puerperal cases. To this reasoning of *Lawrence*, I would add, that diseased brain may depend on the connexion between the brain, the stomach, and bowels. Thus, we see diseased digestion and morbid action of the intestines produce hypocondria and melancholy ; such is often the case from worms. Drunkenness affects the brain by means of the stomach, and prussic acid kills by destroying the functions of the nervous system. The as yet untraced connexion of all the parts of that system, by means of which, when one part is disordered, a distant part becomes disordered also, is physiologically termed sympathy. Thereby intending that the connexion is as yet only known by its effects, and not anatomically shewn.

Dr. Haslam's publications on insanity corroborate strongly all *Lawrence's* reasoning.

but I am convinced from my own experience, that very few heads of persons dying deranged will be examined after death, without shewing diseased structure, or evident signs of increased vascular activity. The effect of medical treatment completely corroborates these views. Indeed they who talk of, and believe in, diseases of the mind, are too wise to put their trust in mental remedies. Arguments, syllogisms, discourses, sermons, have never yet restored any patient; the moral pharmacopeia is quite inefficient; and no real benefit can be conferred without vigorous medical treatment, which is as efficacious in these affections as in the diseases of other organs.*

"In thus drawing your attention to the physiology of the brain, I have been influenced not merely by the intrinsic interest and importance of the subject, but by a wish to exemplify the aid which human and comparative anatomy and physiology are capable of affording each other; and to shew how the data furnished by both, tend to illustrate pathology. I have purposely avoided noticing those considerations of the tendency of certain physiological doctrines which have sometimes been industriously mixed up with these disquisitions. In defence of a weak cause, and in failure of direct arguments, appeals to the passions and prejudices have been indulged; attempts have been made to fix public odium on the maintainers of this or that opinion; and direct charges of bad motives and injurious consequences, have been reinforced by all the arts of misrepresentation, insinuation, and innuendo.

"To discover truth, and to represent it in the clearest and most intelligible manner, seem to me the only proper objects of physiological, or indeed any other inquiries. Free discussion is the surest way not only to disclose and strengthen what is true, but to detect and expose what is fallacious. Let us not then pay so bad a compliment to truth, as to use in its defence foul blows and unlawful weapons. Its adversaries, if it have any, will be despatched soon enough, without the aid of the stiletto or the bowl. The argument against the expediency of divulging an opinion, although it be true, from the possibility of its being perverted, has been so much hackneyed, so often employed in the last resort by the defenders of all established abuses, that every one who is conversant with the controversy, rejects it immediately, as the sure mark of a bad cause—as the last refuge of retreating error."

So far Mr. Lawrence. Lectures on Physiology, Zoology, and the Natural History of Man. 8vo. London, 1819. Pages 105—115. I have already assigned my reasons for making this extract so long.

* Moral medicine can only act by introducing and exciting new trains of ideas and of thought: but these are affections of the brain in fact; and are therefore medicines operating directly on that organ. All ideas of whatever kind, are motions excited in the brain, and there felt or perceived.

The following extract from Mr. Sawrey's edition of Dr. Marshall's *Morbid Anatomy of the Brain*, London, 1815, p. 209, will express my notion of the functions of the brain and nerves very well, except that he has omitted the sympathetic action of the nervous system of excited or depressed states of the parts destined to internal organic life, when different from their usual and natural states. A morbid excitement or derangement of any viscus will affect the state of the nerves belonging to it, and by sympathy (that is innervation) with them, the general nervous system. Hence, the state of the brain, and the ideas that arise in it, will be more or less modified by the state of the organic and internal apparatus destined to keep up life. Hence dreams from indigestion. Hence hypochondria from morbid action of stomach and bowels. Hence, the associations will, to a certain degree, be modified by, and depend on the internal state of the body, as well as on external impressions; and the sensations arising from external impression will, to a certain degree, vary with the general health or disease. Hence sensations, ideas, and associations may arise from the state of the internal organs, and are not exclusively dependent on external impression.

The following extract from Dr. *Andrew Marshall* will shew the generally received doctrine relating to the functions and properties of the nerves, the brain, and the nervous system; and prove that my views of the subject are the same with that of all well informed physiologists of the present day:—

Observations on the functions of the Brain and Nerves, p. 209. "The primary functions of the brain and nerves consist in their rendering us conscious of the existence and properties of surrounding objects: and while in this world, of the existence and properties of ourselves. For although things exist with all their properties independent of us, and therefore when a man perishes, not the smallest particle of surrounding nature is annihilated, or in the least unhinged by his dissolution, yet it is by our possessing brain nerves, that the independent existence and properties of surrounding objects come home to our perceptions. Matter of the same form with that of the human body (except the brain and nerves) might exist and be animated, but without these organs, it would be unconscious of its present existence, or of the properties and various conditions of surrounding nature.

"Living systems destitute of brain shew no signs of their being impressed with any feeling or consciousness. The polypus, according to the observations of Haller and others, has no brain or nerves: accordingly it appears to perform the motions requisite to its preservation by a necessity of which it seems to be unconscious. Vegetables also are living systems, but having no brain they appear destitute of sense. They take in, assimilate, and apply nourishment, perform secretions, generate and separate heat, preserve their own substance from putrefaction, perform motions

in consequence of irritations, and produce prolific seed. But all these actions seem to be performed from blind necessity, and without any sort of intelligent consciousness.

“But in living systems furnished with a brain and nerves, so long as they are entire, and in the condition which health gives and requires, the animal remains sensible of the existence of surrounding nature, or susceptible of that consciousness; but when injury is done to the brain, the consciousness of the impressions resulting from the contact of external matter (of which kind are both light and air) is, according to the degree of injury, perverted, suspended, or extinguished. Yet injuries inflicted on other organs of the body, in no wise affect the sense, unless when they symptomatically involve the brain. The same comparison, leading to the same conclusion, may be made in respect to the diseases of the brain and other parts.

“It must be admitted, that in order to produce peculiar sensations, there must be the health and entire structure of the nerves in connexion with the brain. For to destroy the extremities of nerves, destroys the peculiar sensations which these nerves exhibit while remaining sound. If the retina be injured or destroyed, vision is impaired or lost; if the ultimate distribution of the olfactory nerves be destroyed, there is no more smell.

“Although light should be properly refracted, yet if it should fall on the optic nerve before it expands into retina, it would not occasion any vision; nor would odours, if conveyed to the olfactory nerves within the scull, probably, give occasion to smell; nor is it probable that sapid substances would excite a sense of taste, if applied to any part of the nerves of taste other than the nervous papillæ of the tongue.

“But necessary as the extremities of the nerves are to the production of peculiar sensations, they cannot be reckoned sentient: for if their connexion with the brain be interrupted by compression, no peculiar sensation arises from impression on the extremities; but if the compression be removed, the power of giving the peculiar sensation returns. Yet though the compression of the nerves interrupts or destroys the peculiar sensations usually referred to their extremities, a sense of feeling in different modes, subsists between the part compressed and the brain: so that the power of contributing to a certain degree of sense, which would be lost between the ligature and the extremities, survives between the seat of the injury and the brain. The sort of feeling so remaining is sometimes a sense of obscure touch, sometimes a sense of pricking or a sense of pain.

“We therefore conclude that there is no manner of sensibility in nerves but in connexion with the brain. That the power by which we see, hear, feel, &c. is a power of the brain, the nerves being only a *conditio sine qua non* of particular sensations referred to nervous extremities, and the brain being rather the efficient

cause of these sensations, and giving susceptibility to a certain degree at least to that portion of nerve left connected with it:— may it be added, that independent of any conditional impression on the nerves, the brain itself, from impressions immediately on itself, is sentient ; for let any set of nerves whatever be destroyed, or let no particular impression, whatever, be made on the nerves, a sense of head-ache, vertigo, noise, colors, &c. may be, and often is produced by disease.*

“ The sphere of cerebral power exerted in conjunction with, or in consequence of impressions made on the nerves, is great. By the brain being affected through the medium of the eyes, we are made acquainted with the color, figure, magnitude, and motion of external things placed at a greater or less distance from us. This is the sense of seeing: an inlet to human knowledge, at once necessary to preservation, and to open a view of the striking and beautiful phenomena of nature.

“ The existence, degree of distance, hardness, and several other interesting qualities of objects placed at a distance, seen or unseen, come home to our perceptions, through tremors of the air affecting the brain through the ear. This is the sense of hearing; by which we are warned of unseen danger, perceive operations of nature though unseen, and comprehend the signs or words employed by our fellow creatures to express their sensations and passions.

“ The qualities of sapid substances, which we are interested in perceiving, their sweetness, acidity, bitterness, saltiness, and aromatic nature, are perceived, when these qualities, through the medium of the tongue, excite the proper sensations in the brain. This is the sense of taste. The qualities suggested by taste, constitute a sort of index of the salutary, innocent, or pernicious nature of substances presented as food, rather than point out the actual composition of these substances. This sense seems given chiefly with a view to the preservation of the animal ; for by it, man is induced to take in wholesome food, and to avoid improper and hurtful food : the former being in general agreeable, and the latter, disagreeable, at least to a taste not corrupted by luxury. It is a common, yet curious observation, that the same nerves which are susceptible of impressions from sapid substances, are also nerves of touch ; so that a substance in the mouth, is both tasted and felt ; its superficial qualities of hardness, smoothness,

* The experiments of Sir Everard Home and M. Fleurens shew this. Moreover, as I have observed before in this tract, the organic functions, which in a healthy state go on without producing sensation, in a diseased state, or in a state of great excitement, do produce sensation, by affecting generally the whole nervous apparatus. In a state of over healthy excitement, (if I may so express myself,) dreams are sometimes more intensely vivid than their analogous waking sensations. So, deranged stomach and bowels, and worms, may produce hypochondria, idiocy, and even mania.

&c. being also perceived. This conjunction of both senses, seems requisite in the tongue, since a substance taken into the mouth, may be as hurtful from its superficial qualities, as its roughness, angles, edges, &c. is from its acrid, saline, or putrid qualities.

"The nourishment and refreshment of the body, are farther assisted by our being enabled to perceive certain qualities of sapid substances before we take them into the mouth. This is done by volatile particles of the substances affecting the internal parts of the nose, and through these the brain. Thus, the sense of smelling is auxiliary to taste, as it admonishes us of the quality of sapid substances, before we use them too freely; as it induces us to take in proper food, which is generally of a pleasant smell, if it smells at all; and as it keeps us from unwholesome food, which is generally of a disagreeable odour. Odours are the object of this sense; and different odours affecting the brain through the nose, produce different sensations of smell, as either pungent, sweet, or putrid, &c. These suggest in some degree, what may be expected from swallowing or applying the substance; but express nothing concerning its internal structure or composition. Air is the vehicle of odour.

"To assist vision, and to make amends for its defects, there is a consciousness implanted in us of the contact of external things.* The nerves that receive the impression from which this consciousness results, are almost universally present in the body: and if they remain every where free and connected, in a healthy state, with an entire and healthy brain, the contact of external things, and internal changes, are perceivable in almost every part of the body. Several modes of feeling may be marked: 1st. by the contact of external things with the extremities of the nerves of feeling, we acquire a perception of the hardness, softness, roughness, smoothness, heat, cold, figure, magnitude, pressure, and weight of whatever is within our reach. This is the sense of *touch*, properly so called; the most correct and extensive of all the senses, subservient to self-preservation, and supplying man with exact and enlarged conceptions of what takes place in nature.

"2dly. Certain parts of the body occasionally fall into a state which gives rise to a particular mode of feeling, followed by cer-

* That is, we feel them when they approach us near enough to give rise to this sensation. There is no consciousness different from feeling or perception. When the retina is excited by the light of a candle, and the motion is propagated along the optic nerve to its extremity within the brain, I feel, I perceive, I am conscious, of the impression. We cannot be conscious of the actual contact of the bodies, because no particles of matter are in absolute contact. They recede without solution of continuity by heat, they contract by cold. A ray of light impinging on a looking glass, is reflected, as Sir Isaac Newton has shewn, at the 127th part of an inch previous to contact. All this is well illustrated by the diagram of Father Boscovich.

tain propensities. These give occasion to actions, which being exerted relieve the propensity. Thus a certain languid state of the circulation through the lungs, gives a peculiar uneasy sensation that produces yawning. A sense of irritation in the nose gives rise to sneezing; a sense of irritation about the glottis to coughing; a sense of tickling of the skin to laughter, &c. Some of these peculiar modes of sensation have names, and some have not. Like other sensations, they admit of no definition. Their final intention is evident, since they tend to throw off the offending cause that produces them.

"3dly. Certain parts of the body are constantly in a healthy state, peculiarly susceptible of impression; such as the glands penis, and some other parts; the final cause whereof, is also evident.

"4thly. All the parts of the body, supplied with nerves, are susceptible of impression which gives occasion to sense of pain. The impression here arises from whatever hurts, destroys, or forms disease; and the sense excited by it, makes us take pains to avoid injury, and get rid of disease. By-the-bye, taking man as he is, and admitting the laws of nature at present established, to be wise and good, pain is not an evil, but the result of a wise and beneficent providence; since it tends to preserve our existence more unerringly and directly than any other mode of sense with which we are endowed. The exciting cause of pain is the impression of injury or disease: the efficient cause, the connexion of the part so injured or disordered with the brain; and the final cause, the preservation of the animal. These are some of the modes of feeling: each of the other senses is also a genus, under which are included various modes of the sensation referred to the organ.

"When we compare the different senses together, two or three observations occur to us; one is, that the first four senses take place only when certain due degrees of impression are made on the extremities of the nerves distributed to that organ. If the impression be too slight, no peculiar sense arises; if it exceed in measure, instead of the sense of seeing, hearing, &c. there is merely a sense of pain. Thus, the first four senses, when their organs are injured, agree with the sense of feeling. Another observation is, that as the sense of feeling arises from impressions made in those parts of the body, so it is more difficult to destroy than the other senses. When the extremities of the nerves of the other senses are destroyed, peculiar sensations connected with them, also cease: but the remaining body of nerves retains a sense of feeling: and the extremities of the nerves appropriated to feeling only, being destroyed, the extremities of the portion left, resume the peculiar susceptibility of the original extremities: thus, in the case of W. Scott, whose penis was carried off by a gun-shot, the stump of it, which was even with the skin of the pubis, resumed

the peculiar sensibility of the glans penis : also the cicatrix of sores in other parts of the body, becomes susceptible to impressions of touch.

“ But extensive as the sphere of sensation is, and how much soever of the universe, it unfolds to human comprehension, the powers of the brain are not confined to mere sensation. The brain is likewise the corporeal organ, whose health and entire structure are necessarily connected with all intellectual powers, all internal senses, and all the passions.

“ *Memory* depends on the brain. After living but a few weeks in the world, exposed to the contact of surrounding things, and to light reflected from their surfaces, we cannot avoid recognizing sensations, as being mere repetitions of similar impressions from the same forms of matter. We recognize the similar sensations, and feel within ourselves, that formerly we were affected exactly in a similar manner by the impression on the organ of sense. This recognizing of sensations and belief of their being repetitions, happens by the same physical necessity with which the first sensations of the kind we ever had, arose from the original and first impressions. We cannot but taste, when sapid substances are applied to the tongue ; nor can we pass by the consciousness, that there is a repetition when the same taste is renewed. This is the simplest form of memory : it occurs in an infant a month old, when it begins to recognize its nurse. After living longer, continually affected with the true sense and impressions of external things, and after being masters of more certain experience, we naturally improve upon the simple memory of a single sensation, and acquire gradually a power of recalling a train of sensations, in the order and circumstances in which they were originally perceived. They are recalled with a belief that they were formerly impressed upon us, by objects which do not now affect us. This is memory in greater perfection. A faculty which, spiritual as it may seem, is seldom exerted, but when it sets off from the vantage ground of some assembling, contrary, or otherwise related actual sensation of a present object.*

“ *Judgment* is another power naturally founded in sensation. For to compare two sensations together, to glide insensibly into a belief that they are compatible, or incompatible in the same subject, are as necessary consequences of having formed the sensation, as the sensations were the consequences of the brains having been affected by the impression. Thus, if you present a red rose, to a

* *Hume*, in his Essay on the Connexion and Association of Ideas, and Lord *Kame* in his Elements of Criticism, (Chaper on Ideas occurring in a train) have seen the same facts and reasoned in the same way. But Dr. *Hartley* has treated the subject so plainly, and yet so profoundly, that he has, in my opinion, exhausted it : the objections of modern sciolists to that great man notwithstanding.

child who never has seen one before, but who has seen a white rose, it has immediately the complete sensation of a red rose: and if it can speak it will express a judgment and belief that it is a red rose. This is the birth of judgment.

“The power of *reasoning* in like manner grows out of sensation. For, let a youth after some experience of the properties of things, be supposed master of two distinct independent perceptions, but not to have experience enough to incline him to a belief, that they are naturally and properly compatible in the same object, what resource has he? If the determination interests him, he naturally and immediately recollects a known third perception, with which one of the two sensations is known from experience to agree: and with this third recollected perception, he is insensibly drawn to compare the other perception.

“Let it be inquired, will the eating of the berries of the deadly nightshade kill me? I run back to some conception allied to the question; as that these berries poisoned one of my neighbors. I know that I am of the same nature with that neighbor; so that as the berries poisoned him, and I am of the same nature with him, I conclude, as a matter of experience, that they will kill me.

“In the same manner might we trace *fancy*; the power of *abstraction*; and the power of *classing* things, to their origin from actual sensation;* but that is at present declined. I would only remark, that *all intellectual powers whatever, depend as much on the brain for their exertion, as simple sensation does*: for living systems furnished with no brain, discover as little reason, &c. as they do sense: and injuries done to the brain of the nature of those enumerated above, while they hurt or suspend sense, hurt, suspend, or pervert the powers of memory, reason, judgment, &c. Nay, in some injuries and diseases of the brain, the powers of intellect are more deranged than those of pure sensation. Maniacs, in whom it has been proved, that the brain is topically affected, and probably always in fault, are often exact in particular sensations, but err widely in judgment and reasoning. A sufferer too under the operation of the trepan, is found sometimes possessing feeling; but erring in reason; and refers the whole operation, and all that is said and done, to some other person.†

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“All the internal senses also depend on the brain, and on the perceptions which we cannot help receiving, as we live under the continual contact and impression of external things. These are naturally stems, from which the various additional senses called internal, branch off. We cannot hear sounds agreeable in com-

* Destut Tracey has done this:—T. C.

† I have omitted here a disquisition of about a page and a half on the nature of our sense of beauty; which did not appear to me necessary to the chain of reasoning.

bination, without a sense of harmony. We cannot see the form of regularity of parts, and the color of most flowers, without believing them to be beautiful : nor understand the signs by which our fellow creatures express or betray their feelings, without a belief, that they in return comprehend our signs : nor witness their actions without approving some of them, and blaming others. This is the physical birth of the senses called *internal*, which seem to be peculiar to man : and they also depend on the brain. For not to dwell on other instances, if the most delicate and chaste female be seized with a phrenitis, she loses her habitual sense of delicacy : and if injury or disease in the brain induces mania, the maniac ceases to feel the obligations of morality.

"The distinction of sense into external and internal, does not go to discriminate the two sets of sense ; for they are equally internal and external. Nothing farther can be understood than that the one set of internal senses is excited when external things affect the organs of sense : but the other does not immediately require the impression of external things to produce them.

"Lastly, *all the passions and appetites* depend on the brain, for their corporeal organ. Objects whose properties come home to us through the primary sensations, do not leave us in a state of indifference. The primary perceptions give birth to senses called internal ; and the internal senses to appetites, passions and volitions. These depend upon the brain : not only because they grow out of sense, which depends on that organ, but because when the brain is injured or diseased, it is found equally or more severely to alter, pervert, or extinguish passions and appetites.

"In phrenitis, no alteration is more remarkable than alteration and disorder in the passions. This will appear from an unusual apprehension of imaginary evils, an unusual anxiety about friends, and unusual hatred against enemies. I once saw a phrenetic patient with Dr. Pitcairn, some of his senses were lost ; taste in particular. But his regard for his wife was expressed in a tempest of passion ; it was the rage of love : at other times he had the most delicate, yet groundless jealousy. Maniacs in the exacerbation of their complaints, are preternaturally irascible or furious ; they go into fits of devotion with a fervour and religious awe, of which sound reason is hardly susceptible.

"There is a remarkable peculiarity in the state of the brain, observed as a law of the animal economy, which is, that the exertion is subjected to a periodical suspension more or less complete, called *sleep*. It is a complete suspension of the power of the five senses, and of the action of the voluntary muscles ; for in sound sleep, particular sensations do not occur, nor are the powers which grow out of sensations exerted. But, in unquiet nights, though no actual sensation occurs, no immediate impression on any organ of a peculiar sense being perceived, the powers of memory, fancy, reason, and judgment, with various internal sen-

ses and passions, are differently exerted. They proceed in an unusual way, not for want of reason, but from want of actual sensations to correct wrong judgments and to direct all these powers according to the reality of things.*

“The effect of *sleep* is to restore the power of the brain and nerves.

* The brain, as the chief seat of the nervous apparatus, is liable to be affected by impressions made by external objects on the senses—by any preternatural or morbid state of the organ itself—by any sympathetic affection with the internal organs or viscera—and by the state in which it is put by the various associations of past impressions. Hence when morbidly excited, as in the lower states of phrenitis, apoplexy, or gout, sensations arise both sleeping and waking, that would not occur in its common state; the impressions and associations are altered and modified, and all intellectual processes are correspondently deranged. Why? Because according to the acknowledged axioms of the schools, the character of the recipient determines the mode of reception of the thing received; *quicquid recipitur, recipitur ad modum recipientis*. Hence Mr. Owen of Lanark is right in supposing that man is the creature of the circumstances in which he is placed. Suppose four human beings with organs similarly constituted in all respects at ten years of age, one bred up among the Brachmins of Hindostan, one as a Mussulman at Constantinople, one among the strictest sect of Calvinistic Seceders, and one among the Savans of Paris: it is manifest, the impressions and associations to which the nervous systems of these beings would be respectively exposed from the age of ten to the age of fifty would be extremely different: their intellectual powers would be different, and the effect of motives and of evidence upon them, would be as various as their various educations. For I submit the following reasoning as unanswerable. The brain (place the seat of sensation wherever you please) is subject to the laws of the animal economy: it is passive in receiving impressions: the state of the brain is modified by the impressions it receives: the state of its associations of impressions with ideas, of ideas with ideas, depends upon the actual state of the brain, however produced: all the intellectual powers consist of, and depend on, the associations of ideas (that is, of associated motions excited or occurring in the seat of sensation:) hence all intellectual powers and processes, whether *in potentia* or *in actu*, are dependent on the state of the brain or seat of sensation; and therefore on the circumstances which have produced this involuntary state of the organ, whatever those circumstances may have been. But let us take for granted a Soul. Then if the brain can thus modify the Soul, and the Soul thus modify the brain, are not both the one and the other material—subject to the laws of organic matter? What then do you gain by introducing this creature of metaphysical fancy—this hypothesis which adds no force, and removes no difficulty? Which must act upon matter, and be acted on by matter, to make its existence evident? Which those who believe in it, acknowledge to be a mere *ens rationis*? Which has never been seen, felt, heard, or understood? Which is not cognizable by any human inlet of knowledge? Whose introductions and pretensions can be well traced to the power it affords the clergy over the conduct and belief of their fellow creatures? And which can derive no countenance from the words or actions of Christ or his Apostles, or the general belief of the Christian world for at least four centuries after Christ?

Independent of the sealing up of actual sensation, the muscular parts in themselves require periodical suspension or abatement of their energy. Long continued actual sensations, strong sensations lasting but for a short time, suffering of moderate pain for a long time, or intense pain for a short time, much thinking, pursuing a long train of abstract reasoning, great exertions of memory, &c. gradually blunt the powers of the brain and nerves, and a cessation of actual sensation occurs: and, if in this insensible state, other powers of the brain be exerted, their exertion is less fatiguing than when we are awake, because in sleep, their exertion is not fixed or regulated by attention, which is one of the most fatiguing powers of the brain. In like manner, long continued muscular action of the voluntary muscles, induces a sort of inability in them, and in sleep their energy is restored. On awaking after a due length of time spent in sleep, all the powers of the brain, and the energy of the muscles are restored in a proper degree.

"I cannot quit this part of the subject without observing that all the powers proved to belong to the brain, are equally peculiar in their nature. To be conscious of the figure of a circle, or the colour of a flower, is as refined and wonderful a power as reasoning is. And though these powers to the vulgar belief are a necessary consequence of an impression on the organ of sense, they have as little resemblance to such impressions, as reasoning in an abstract manner has.*

"There are yet two other questions, which seem necessary to be considered. *First*, whether the brain properly so called, and the cerebellum, medulla spinalis, &c. possess equal sentient powers?† No doubt can remain that they do, when we consider that

* This passage seems to allude favorably to Berkely's hypothesis. In fact, the external world is an hypothesis to account for our sensations; but an hypothesis to which we are irresistibly driven by the laws of the animal economy, which compel us to resort to it. Doubtless, as our author says, there is as much difficulty involved in the fact of sensation or perception, as in any process of reasoning. They are both processes depending on the properties of the bodily organ employed in them: properties, which we can no more explain than we can explain the cause of life, electricity, or gravitation. These are all properties belonging to the substance with which we find them connected. In like manner, perception or sensation, thought, volition, &c. are properties of the substances with which we find them connected. If the latter require a Soul to explain them, so do the former; no good reason exists in one case, that does not in the other. If gravitation be an essential property of any given mass or matter, so is perception and thought of the nervous apparatus of the human being; and for the like reason in both cases, viz: we see them constantly accompanying each other.

T. C.

† Further experiments are necessary to determine this. Those of Sir Everard Home and M. Fleurens, if followed up, would assuredly throw light on the functions peculiar to the various parts of this organ.

T. C.

injuries or disease in whichever of these integrant portions of the whole mass they happen, equally occasion stupor and insensibility, or are accompanied with violent exertions of the muscular powers. But the muscular disorder is most obvious, when those parts are affected which give origin to nerves, that supply the involuntary muscles. Also, injuries or disease prove equally fatal, whether in the brain, cerebellum, medulla oblongata, or medulla spinalis. A man is killed by being shot through the head. The fiercest bull is instantly killed by thrusting a knife through between the first vetebra, and the posterior edge of the foramen magnum occipitis into the beginning of the medulla spinalis.* An elephant is killed in the same manner. Robert Walker, a soldier, was killed by a shot through the cauda equina. Lastly, the equal sentient power of these different portions is evinced, by their giving origin to nerves of particular organs of sense. The brain gives nerves to the nose and eyes; the cerebellum to the skin, muscles of the face, the tongue and the teeth. The medulla oblongata gives nerves to the ear; the medulla spinalis to the muscles and skin of most of the body.

“The *second* question is, whether the whole substance of the brain, cerebellum, be equally sentient? The nerves proceed from the medullary, not the cineritious part. This continuity of substance, compared with the effects of tying, dividing, or destroying nerves, renders it probable, that it is principally the medullary parts of the brain, which are the origin of the power ascribed to it.† The medullary substance of all the portions form one continuous mass, is apparently fibrous, the fibres being incredibly minute,‡ convolved in regular intricacy, apparently without beginning, and ending no where but in the extremities of the nerves. The two hemispheres of the brain communicate by transverse medullary bands, and by the union of their crura; while the medullary crura of cerebellum, blend with the medullary crura of cerebrum, &c.

“In the next place, in Haller’s experiments on living animals,

* This experiment of Vesalius, Dr. W. Hunter used to exhibit to his class on a jackass. It is the Spanish mode of killing, not only at their bull fights, but among their butchers; and it is doubtless a humane one. T. C.

† There are some facts of lesions of the brain, that have not yet been explained. Many are collected on dubious authority by Dr. Ferriar, in his letter to Th. Cooper, Esq. in the fourth volume of the Manchester Transactions; and many on better authority by Sir Everard Home. Anatomists and physiologists, however, agree in considering these anomalies as not militating against the general position. Future experiments may well explain them. We are in the infancy of medullary physiology as yet. T. C.

‡ Gall & Spurzheim’s anatomical exhibitions of the structure of the brain, I apprehend, have settled the fibrous nature of the medullary substance, in the way nearly as Marshall has stated it. The other parts of their craniology are not yet so clear. T. C.

instituted to determine the different degree of sensibility of different parts of the body, it appeared that the victim of his inquiry, manifested most evident signs of pain, and fell into most violent convulsions, when the medullary substance of the brain was pierced or broken down : but that these symptoms were less considerable when the injury was confined to the cineritious substance.* Accidental injuries seem also to hurt or disorder sense, according as they extend their effects to the medullary substance. A blow on the upper part of the head, does not stun so suddenly, as a blow near the base of the skull ; the cineritious substance abounding in the upper part ; the medullary being exterior in the basis of the encephalum.

“ If judgment may be formed from one or two cases, a fracture with depression of the os frontis, causes less stupor than a fracture with depression of the parietal bones—the anterior lobes of the brain being supported on the orbital processes of the frontal bones : but the middle part of the hemispheres gravitating on the whole medullary substance below, the compression must extend its influence to the whole. These opinions are strengthened by the case of a soldier, who recovered after being shot through the fore part of the cranium ; and from another in whom a piece of the barrel of a gun, was beaten into the fissura magna sylvii, where it remained two days without any violent symptoms, being lodged chiefly in the cineritious substance.

“ From these circumstances, it is concluded, that the medullary substance at the origin of the nerves, is principally concerned in the functions ascribed to the brain ; and if it would throw greater light on the subject to determine the seat of the soul, we would allege that the whole medullary substance is that seat.†

“ So much we have advanced respecting the precise functions of the brain. It is established we hope, beyond all doubt, that the brain so far as a corporeal organ is concerned, gives sensation, intellect, volition, appetite, and passion. Beyond these, its powers seem not to extend as we shall endeavor to shew. By the brain, man is rendered speculative and capable of understanding,

* I refer to Sir Everard Home's experiments before alluded to.—T. C.

† He says well, *if it would throw greater light on the subject*. What light can be thrown on the functions of the brain, by the supposition of its connexion with a being totally and essentially dissimilar in its nature, and having no common property with the matter of which the brain is composed? But if the seat of the Soul be in the medullary substance, then has the Soul all the properties of matter, and is material. For having relation to, and occupying space, and space too of a determinate form, then has the Soul solidity, extension, and figure : and as the Soul is placed there to act upon the brain, she has the common properties of all matter, attraction and repulsion, into which all action upon matter (by common consent) can be resolved.

and at the same time inclined to action : and is thus fitted for the place he holds in the system of nature.*

"It is unnecessary, we presume, to guard the account given, by subjoining that when we call the brain the sole organ of sensation, and of all the powers superadded to sensation, we only mean the sole corporeal organ. For reason and the testimony of God declare, that in man there is an immaterial substance, which has a share in perception, thinking, and reasoning, &c.—a mind united with the brain. But an inquiry into the human Soul, is not within the design of this paper. In this account of the brain, no mention is made of the Soul, because it is only the corporeal organ of the powers explained, that we are considering. That there is a soul within us, as well as an omnipotent spirit, that fills, sustains, and actuates the universe, I firmly believe. No less do I believe so from reason, than from the sacred monuments of divine inspiration. But it is to be observed, that in this state of our existence, no act of the mind, can be, or ever is exerted, without a corresponding condition of power in the brain. Brain and Soul, though it is unknown to us, how they are united, are joint agents in this world. The power and health of the former, in every exercise of sense, judgment, memory, passion, &c. is indispensably necessary, and equally so with the presence of the mind. Besides, the brain, and not the Soul, is the proper object of medical or surgical treatment. Had we introduced the mind into our discussion, we must have thrown the brain into the back ground ; or have encumbered the narration, with a constant coupling of brain and mind."†—p. 244.

Thus far, Dr. Marshall, on the functions of the brain and nerves. It is manifest that he, like Dr. Rush, and many others, was a materialist ; but was restrained by popular prejudice, from bringing the whole truth into open day. I cannot blame him. Who can see the obloquy connected with the character of Mr. Lawrence,

* Here ends the *physiology* of this sensible writer ; to all of which (subject to the limitations which I have expressed in these notes) I subscribe, as an excellent compendium of that branch of Metaphysics called Ideology ; and beyond all comparison conveying that real knowledge which Dr. Dugald Stewart, with his metaphysical predecessors of the same school at his heels, was so grossly deficient in. More is to be learnt from this summary of Dr. Marshall, of genuine physiological metaphysics, than from all the pages of inanity of the writers so much in vogue among those who read without thinking. A man who will separate metaphysics from physiology, is not to be reasoned with.

T. C.

† I consider all that follows of Dr. Marshall from the end of this paragraph, as a sacrifice on the altar of prudence to popular prejudice. *Lawrence* is cried down for refusing to pay this homage to the priesthood ; and most disgraceful it is to *Abernethy* to have encouraged this hue and cry of ignorance and bigotry against a fellow professor, in practical knowledge of his profession at least his equal, and in professional reading so decidedly his superior.

T. C.

notwithstanding his eminent learning, industry, and professional skill and knowledge, without excusing the writers, who shelter themselves from the yellings of the bigots, set on by priests whose interest it is to cry out, "Great is Diana of the Ephesians?" If the present clerical combinations in which all sects join, however discordant on other subjects, should succeed to bring on again the night of ignorance, (which I much fear will be the case,) the advocates of truth, must rest contented with having deserved the success they could not obtain.

TH: JEFFERSON TO DR. COOPER.

I received, a day or two ago, a small pamphlet on Materialism, without any indication from what quarter it came: but I knew there was but one person in the United States capable of writing it, and therefore am at no loss to whom to address my thanks for it and assurances of my high esteem and respect.

MONTICELLO, March 29, 1824.

FINIS.

OUTLINE

OF THE

ASSOCIATION OF IDEAS.

BY THOMAS COOPER, M. D.

ON THE ASSOCIATION OF IDEAS.

So little attention has been paid of late days to that profound and important book, *Hartley's observations on man*, first published in two vols. 8vo. 1749, that I am tempted to state some of the leading facts relating to the Association of Ideas, so well explained in that treatise. Dr. Jos. Priestley brought this work into notice among his followers; and the *Zoonomia* of Dr. Darwin is mainly founded on the doctrines of Hartley, Brown, and Girtanner. The doctrine of association has received also much attention in the writings of Condillac; but I do not find that Hartley's book is noticed by any of the modern French ideologists or physiologists, Cabanis, Destut Tracey, Richerand, Majendie, Adelon or Broussais: but there seems to be almost as much neglect and ignorance among the French physiologists of what the English have done, as there is of what the French have done, among the English.

The following brief sketch will by no means supercede the necessity which I consider every well informed physiologist and ideologist to be under, of perusing with attention the first volume of Hartley's work; to which, notwithstanding its hypothetical superfluities, hardly know any book in the language superior, in profound and accurate reasoning, and extent of application. Priestley abridged it; but the book itself is so condensed in matter and manner, that it should be read as Hartley wrote it. His theory of vibrations first suggested by Sir Isaac Newton, misconceived and misrepresented by superficial readers, may be true or not true; I incline to agree to it; but the facts relating to the extensive association of sensations with sensations, of sensations with ideas, of ideas with ideas, and of both with muscular and other corporeal motions both antomatic and voluntary, instinctive and intellectual, healthy and diseased, are perfectly undeniable: they are not theory, but fact.

The association of ideas was first noticed by Mr. Gay in a dissertation prefixed to King's Origin of Evil, and afterwards by Mr. Locke in his Treatise on the Human Understanding, book II. ch. 33. Hartley's book is noticed by the Scotch metaphysicians in the superficial and flippant manner that might be expected from persons who either could not or would not take the pains of un-

derstanding it. But Messrs. Reid, Oswald, Beattie, Dugald Stewart, and Thomas Brown, have had their day. They are favorites with the clergy, for they are of the orthodox school of ideology; they are ontologists and psychologists; they offend no popular prejudices; they run counter to no clerical doctrines; they express due horror at the tendencies of heterodox metaphysics; their style of writing is for the most part good, frequently marked by elegance and taste; while the dogmatism that pervades their pages of inanity is well calculated to impose upon the numerous class of readers who are content to read without thinking. But the progress of accurate physiology, has destroyed them: the thinking part of the public which ultimately gives the tone to the much larger part that does not think, is wearied with toiling through pages after pages of figurative words and phrases without distinct meaning, and calls aloud for facts in the matter, and precision in the language. I was induced to draw up the following sketch originally, from perusing the elements of criticism of Dr. Blair and Lord Kame, during my course of lectures on this subject, in the college over which I preside; and from observing how much more satisfactorily the principles they attempt to develop might have been explained and illustrated, had they known any thing of the doctrine of the Association of Ideas. Thus, all the confusion and obscurity in Lord Kame's account of ideas occurring in a train, and connected with preceding ideas—his laboured and not very clear explanation of what he calls *ideal presence*—of emotions, passions, sympathies and sympathetic emotions—of emotions similar to each other—of emotions connected with music—and many others, rank among the plainest cases of association. Dr. Jos. Priestley was aware of the influence of this doctrine on these subjects, and has noticed its application in his “Lectures on Oratory and Criticism” which have added nothing else to Blair and Kames. Although aware of its utility, he has made but little use in his lectures of this doctrine compared with its manifest extent of application, for want as I conjecture of sufficient acquaintance with physiology.

In stating the following outline of the “Association of Ideas,” I do not profess to advance any theory either of my own, or of others. I state plain, well known, undeniable facts; familiar to every physiologist who has ever turned his attention to the catenation of stimulations and motions in the nervous fibre, but utterly disregarded by the tribe of metaphysical logomachists, who never dream that the phenomena of the body, are of any use in explaining or accounting for the phenomena of mind. This class of writers, are content to decry an opinion, if its tendency, immediate or remote, be what the clergy call heterodox, and dangerous; as all opinions are, whose tendency is to lessen the influence of that order of men, or expose the management by which they hold the ignorant in subjection. What is orthodoxy, and what is heterodoxy?

said *Lord Sandwich* in a debate upon the corporation and test acts. Orthodoxy my lord, said *Bishop Warburton*, is my doxy; heterodoxy is another man's doxy. It is high time to discard the enquiry, what is the tendency of an opinion, and substitute in lieu of it, the question, what is the fact and the truth? these can never have a bad tendency; though the bigots who imprisoned Galileo, and discarded Lawrence and Macartney, thought otherwise. What is the motto of truth? Give us day light and fair play.

The outline of the doctrine of the *Association of Ideas*, then, is as follows:

When an impression, or stimulation, is applied to any sentient extremity, it is propagated by some kind of motion along the course of the nerve to the brain. The motion thus propagated along the course of the nerve toward the brain, has been subject to the following suppositions:

1st. That it is a vibratory motion—an oscillation of the body or cord of the nerve. But this is not the opinion of Sir Isaac Newton, or Dr. Hartley, or of any author of note with whom I am acquainted; though it has ignorantly been imputed to Hartley: and it is unlikely in itself, since the nerves are nothing like the stretched cords of a harpsichord: they are comparatively soft bodies imbedded in soft bodies.

2dly. That the minute particles of which the nerves are composed, are put into a vibratory motion which is propagated *along* the whole substance of the nerve in the same way. This seems to have been Hartley's opinion. It may be so, but we have no sufficient proof to establish the existence of this kind of motion in the nerve. He calls in aid Sir Isaac Newton's Ether; but that is hypothesis.

3dly. The nerves have been supposed to secrete a very subtle fluid, which is the subject of these successive impulses or vibrations; but this fluid has never been shewn, or its nature ascertained, or its mode of receiving and communicating impressions, in any satisfactory manner explained.

4thly. It is rendered probable, (but by no means certain) that the galvanic fluid is the agent on this occasion: from the electric powers of the torpedo, gymnotus electricus, silurus electricus—from the experiments on digestion, and respiration by Dr. Wilson Philips, Dutrochet, and others—and from the observations of M. Le Gallois. But this opinion is yet an opinion only, founded, so far as it goes, more distinctly upon facts than the others, but by no means ascertained.

Yet, as the table can make no impression on the medullary substance of which my brain is composed, but by some medium of communicated motion, it is absolutely certain, that the motion of something or other moved on this occasion, must of necessity take place. There *can* be no motion but of something moved. By the brain, I mean those portions of medullary substance so called, that

the facts observed point out as including the seat of intellect: the cerebrum, or fore part of the brain—the cerebellum, or hind part, and the medulla oblongata: altogether, forming the encephalon. The brain (as is said) appears from observations on the fœtus, to be gradually formed by elongation of the spinal marrow. The nerves are for the most part in pairs, and the brain also is for the most part duplicate, as Gall and Spurzheim have observed. As yet, no apparatus has been traced, by means whereof the electrical or the galvanic fluid is secreted, or accumulated in land animals, as it is in the fishes before mentioned. When the motion, whatever it be that takes place, is in some way or other communicated from the sentient extremity of the finger, for instance, to the medullary substance of the brain, (as above explained) it is there *felt*, or as the now adopted phrase is, *perceived*. Every sensation, therefore, is essentially, A MOTION IN THE BRAIN PERCEIVED. This is so true, that it is expressly acknowledged and taught by all the late physiologists of repute; and may be found distinctly stated in Richerand and Majendie, the two latest and most approved elementary authors in use among us; and I consider it as demonstrated by Dr. Darwin in his *Zoonomia*, Sect. 3, and elsewhere. The motion thus communicated—how and by what means is it felt or perceived? There are two opinions on this subject principally agitated, to which a third may be added.

1st. From the great difficulty of conceiving how perception, thought, and intellect, can arise from any particular arrangement or disposition of parts which are previously *devoid* of all these qualities, and consist merely of inert, unfeeling, unconscious matter—philosophers, especially divines, have been strongly led to the hypothesis of a being, or principle, distinct from the body, having no quality in common with it, immaterial, not dependent upon it or dying with it, but surviving it, and supernaturally added to our system of organized matter; by which union, we are enabled to exhibit the phenomena of intellect. This immaterial being, or principle, is the SOUL. According to this opinion, the motions that take place in our nervous system, are perceived or felt by the soul, and become the subjects of its operations; all the phenomena termed mental or intellectual, proceeding essentially from the faculties of the soul as a distinct being; and from this conjunction of soul and body, they become developed and apparent in the compound being called man; in whom the *body* is perishable and destructible—the *soul*, imperishable, indestructible and immortal. This has been for many ages the prevailing opinion among men of learning and reflection. It is the opinion of a very large majority of the divines of our day; to them, a very convenient and lucrative one; it is the common opinion among writers on metaphysics also, particularly in Scotland. This is the opinion taught as true in every university and collegiate seminary in England, on the continent of Europe, and in our country.

It has, therefore, the decided suffrage of modern authority in its favor ; but it has been artificially kept up, and at present is fast losing ground.

2dly. Another class of philosophers, chiefly in England and France, are of opinion that all the mental or intellectual phenomena can be explained from the properties of the organized body, without the intervention of any distinct immaterial principle, such as the soul is described to be, provided the property of perception or feeling, be allowed to belong to, or arise from our organization, as the fact *appears* at least to be. They say, that life and perception, are as much the result of our peculiar organization, as any one property is the result of any system whatever. They say, that there is no foundation, but constant concomitance, on which we can build any case of necessary connection, whatever, or assert in any case, that one thing is the property of another : that the phenomena termed mental, must be considered as arising from, appertaining to, and as essential properties of animal organization ; because they have never been observed, unless in conjunction with a corporeal organized system—are always found to accompany it ; to grow with its growth, to be of a higher perfection as the organization of the animal is more perfect ; to depend on the healthy state of the nervous system ; to become disordered by nervous disease or derangement ; to decline as the body and its organization declines ; to grow old with the body ; and to cease to be, when the body dies. They assert, that there is no evidence whatever, for the existence of the faculties of the soul, or any of them, but what arises within, and depends on the body. That it is plainly impossible for our material senses and organs to be impressed by, or have any idea of, a being that has no one property of matter. That all the difference between man and other animals, in point of intellect, is in proportion to their difference in point of organization. That the phenomena termed mental, are as really exercised by other animals, as by man ; but in degrees greatly inferior, from the very great inferiority of organization in other animals : and that they are in all cases reducible to corporeal affections. Moreover, they assert as matter of indisputable fact, that compound bodies exhibit properties and results altogether different from the properties of the component parts.

This opinion prevails among many anatomists and physicians in England and France ; and among the followers of the religious tenets of Dr. Priestley. A very serious objection has been urged to this doctrine, that it deprives us of the arguments for a future state of existence drawn from the natural immortality of the soul. To this, the Priestleyans reply, that a christian is not affected by this objection ; inasmuch as the resurrection clearly taught in the New Testament, is the resurrection (not of the soul) but of the body. That this tenet is adopted as an article of faith in the Apostle's creed, which only recognizes the resurrection of the body. That

the scripture language gives no encouragement to the existence of a distinct, immaterial, naturally immortal principle called the soul. That this is in fact acknowledged by learned divines and dignitaries of the English Episcopal Church, by Tillotson and Sherlock—by Watson, Bishop of Landaff, who states it as an unsettled question, and by Law, Bishop of Carlisle, who openly denies that the Old or the New Testament countenances this doctrine of a soul. To all which, I have nothing to say: those who really believe so, have a right to believe so; those who believe otherwise, have a right to believe otherwise: we may judge for ourselves, but not for them.

3dly. Another opinion respecting intellectual phenomena, including perception, is, that they are indeed phenomena of organized matter, but as we know of no kind of matter capable of organizing itself into an animal form, unless in consequence of animal life, previously communicated by means of parentage, we have no authority for asserting that it actually is, or in any case can be so. They who hold this opinion, deny the doctrine of *equivocal generation*, or of life being the result of any form of organized matter to which it did not previously belong: and they will not admit that the few dubious instances suggested by Dr. Darwin, Mr. Baillie, and M. La Marck, or the *nisus* formations of Professor Blumenbach, or the late microscopic discoveries, are sufficient to establish a doctrine, contradicted by all the plain and distinct cases with which we are acquainted, and which manifestly points to a living principle, previously existing, imparted in all *known* instances, vegetable as well as animal, whose origin we can only refer to the Almighty Creator, who endowed us with it. I feel strongly the difficulties of this subject. But this is a question that I see no means, in the present state of our knowledge, of settling to universal satisfaction.

Dr. Hartley thought the soul was some very fine etherial substance added to the body, and that survived it. But this unsupported opinion does not advance us one step. If it have the properties of matter, or any of them, it is so far matter; if not, the old question recurs, how can one thing act upon another, without any common property? This notion has been revived lately by Abernethy.

Having thus disposed, as well as I can, of all the preliminary questions that beset me in my progress, I proceed to state, the outline of the *facts* relating to the organized animal man, that arrange themselves under the law of the association of ideas. In all our inquiries as to the phenomena of mind, we should endeavor (as I think) to ascertain, how many of them are explicable from the mere phenomena of the body; and call in the hypothesis of a superadded principle of intellect then only when the known properties of organized matter, will explain no more. So far as I can yet see, every intellectual fact, by whatever form of phrase or figurative expression it may be described, is no other

than the usual normal function, or mode of action of the organ called the brain: some motion in, and modification of, the cerebral or encephalic viscus. Thought, judgment, reason, reflection, the will, the understanding, the memory, &c. are words only, not distinct beings, or entities: they designate particular states, affections, or functions of the cerebral mass; that is, certain motions that take place in it, of which we are conscious, as the French say—which we feel, or perceive, as the English say. The propensity to fiction, of the modern metaphysicians, have clothed these words with a separate existence, and personified them. But this poetry of metaphysics—this prosopopeia of orthodoxy, is not reasoning.

An additional question however, occurs; when these motions along the course of the nerves reach the brain, is there in that organ any common sensorium—any seat of perception located in some peculiar part of the brain? It has been a prevailing opinion that there is such a spot. Sir Isaac Newton and Dr. Hartley adopted it; so does Broussais. I know of no proof that will establish such a locality. That the motions communicated by the organs of the several senses respectively, do in fact modify each other, when associated synchronously or by short intervals of succession, appears to be matter of fact beyond the reach of denial; but whether this be owing to their uniting at or near some terminal point in the brain, we have no means of ascertaining. I therefore use the term brain, to signify that portion of the nervous system, within the skull, and a small part of the spine, wherein the motions propagated from the sentient extremities of the nerves external or internal finally cease; and from whence, the motions propagated to the voluntary muscles, commence. This may be for aught I know, a particular spot, in the medullary substance of the brain as I have defined it (cerebrum, cerebellum and medulla oblongata) but I do not know that it is, from any anatomical or physiological fact as yet ascertained. Dr. Darwin's opinions make it pervade the whole nervous system, his sensorial power being co-extensive with nervous ramifications.

Injuries have been done to various parts of the brain, without inducing an expected injury in the same proportion, either to life or intellect. Many of these cases, have been collected (not quite on satisfactory authority) by Dr. Ferriar, and many upon somewhat better authority by Sir Everard Home. Whether it has been owing to the more insignificant character of the part injured, or to the double character of the cerebral organs, or to the distinct functions of each part of the brain, that no more mental injury has accrued in the cases referred to, is not yet sufficiently known. The *general* fact, well established, is, that when the brain is injured, the intellect is injured also. The major part of apoplectic, lunatic and maniacal cases may be cited in full proof of this. Marshall, Abernethy and Abercromby furnish them in abundance.

Having now traced the progress of sensations caused by *external* objects, from the sentient extremity of a nerve up to the brain, I have to notice the impressions that may be made on the brain by means of the *internal* state of the body, operating on that organ; and which formerly have not received so much consideration as I think they are entitled to. Broussais terms this kind of nervous sympathy, *innervation*.

Nerves proceed both from the brain and spinal marrow to supply the heart, stomach, liver, intestines, and other parts whose functions while in a healthy state, go on instinctively, automatically, and unperceived by us; exciting no sensation accompanying their actions. But as the nerves that supply these parts, are extensively connected with the whole nervous system, any variation from an usual or healthy state of these or any of these viceral portions of the body, will affect the state of the brain and of the whole nervous system. Thus lunacy and ideocy may be produced by excessive hysterics; by worms in the intestines; melancholy in form of disease, by an irregular state of the bowels and vice versa; mania by stimulating liquors, or narcotic vegetables; and the general state of uneasiness felt, when we have some unascertained internal complaint, is undoubtedly owing to a series of morbid motions that take place in the viscera, transmitted to the brain, to which from their occurring but now and then, we have given no regular appellation; nor have we any means of referring to their exact internal locality.* All our sensations and ideas, depend conjointly upon the objects that excite them, and the state of the organ in which the excitement takes place. So that if the state of the nervous system of one man differs from that of another, the same exciting causes, will not produce exactly the same internal motions and associations; but these will be modified not only by the great variety of synchronous associated circumstances, but also according to age, sex, original constitution, previous habits, visceral affections and the general state of health and disease. These considerations will well explain the different points of view, in which the same subjects appear to different persons; and furnish-

* As the whole nervous system of organic life, is connected directly with the brain, by means of the spinal marrow, there can be no difficulty in referring those actions called sympathetic to this connection. As when the brain is partially paralysed by alcoholic potations taken into the stomach, or paralysed unto death by a strong dose of prussic acid, or when tetanus is produced by a wound with a rusty nail, &c. In this last case for instance, the nervous power over the muscles of voluntarity, is affected; and therefore the source of the complaint must of necessity be in nervous communication; what Broussais calls innervation. In the case of the sympathetic action of medicines as it has been called, it is ascertained, that many of the cases have depended on absorption, and others on nervous communication, as no one could doubt who had read, Mr. Brodie's essay on the operation of poisons.

es an adequate cause of many of the differences in intellect and inclination. For the old metaphysical adage is literally true *quicquid recipitur, recipitur ad modum recipientis*. All those internal operations of our system which in the ordinary state of perfect health are not perceived, become sources of sensation when they recede from a healthy state; as a non-sentient surface becomes painful in a state of inflammation. Hence the source of incubus or the night-mare from indigestion, and of dreams generally, which are motions in the brain *similar* to such as have been excited by external objects, and are then perceived under irregular associations in consequence of the half-wakefulness of imperfect sleep. They occur with little or no connection, because the uneasy state of the internal organs which causes them, has few or no associations to furnish such a connection; and therefore the law of association to be explained by and by, operates but partially and imperfectly: and in this partial and imperfect association, the strangeness of our dreams consists.

The same law of nervous communicated motion, takes place in our internal viscera, as in other parts of the body. Thus, in the late experiments of Mr. Brodie, Dr. Wilson Philips, and others, if the eighth pair of nerves, or the sympathetic be cut or intercepted, the functions of the stomach, lungs, and the generation of animal heat, are affected also; and the parts are paralysed.

I now go on to state a few of the general laws of association, as mere matters of fact, and physical observation; referring to Hartley and Darwin for details.

By a *sensation* is here meant a motion excited by some external object, at the sentient extremity of a nerve and thence propagated along the course of the nerve up to the brain, and there felt or perceived. Or, it may also be, a motion internally excited, in a nerve within the body, in consequence of some unusual or diseased action in the part supplied by that nerve; and this motion is propagated along the course of the nerve up to the brain: as periodical hunger, want of excretion, generation, &c. as the pain of gout in the toe, the stomach or kidneys; of colic in the intestines; the pain down the thigh in renal inflammation; or under the shoulder in affections of the liver, and innumerable others.

By an *idea* is here meant a motion in the brain, similar in kind and in locality to a precedent sensation, and by means of which, the sensation is recollected. Ideas are the immediate objects of recollection and memory. An idea therefore is the representative of a previous sensation, morbid or healthy—external or internal. The first time a child sees a peach, it is a sensation; when at some subsequent time the peach is remembered, it is an idea. That it is a cerebral motion see Darwin Zoon. sec. 3.

Proposition 1. Any set of sensations A, B, C, &c. being associated with each other a sufficient number of times, obtain such a power over their corresponding ideas a, b, c, &c. that any of the

sensations (A for instance) when impressed alone, shall be able to excite b, c, &c. the ideas of the rest.

Suppose we are reading together in the same book at the same table; and that the cat jumping on the table and walking over the book, prevents our reading. If a twelvemonth hence you meet me, the sensations of my person will call up the ideas of the table, of the place and situation, of the cat, and of the book; i. e. they will be remembered. In what precise manner the mingled motions of these sensations, should excite a correspondent modification in that cerebral motion to which we give the name of idea, I cannot undertake to explain. It rests among the very many matters of fact, indubitable but inexplicable. But common experience establishes the fact, as resulting from a general law of our nature. So, the name, the odour, the taste of a peach, to a person eating it in the dark, and who has seen and tasted them at other times, will suggest the form and colour of a peach; that is, its visible idea, and vice versa.

Prop. 2. If the sensations occur only in a certain order of succession, the power they have of calling up ideas, will be exerted only in the order in which the original associations were made. If A, B, C, D, E, F, occur in that order, C will suggest d, e, f, but not a, b. We can say the Lord's prayer: which of us can say it backward?

Prop. 3. Simple ideas will run into complex ones by association.

Let A, B, C, D be frequently associated together in all varieties of combination, then will a, b, c, d recur so instantaneously and mechanically, as to form not a succession of ideas, but one mingled and complex idea. Let the size, the shape, the colour, the down, the odour, the flavour of a peach, be frequently associated with the name; as is the case in fact: then will the name suggest all the other ideas so mingled, as to form what we call the abstract idea of a peach: in which mingled and complex idea, those individual ideas which are most prominent and characteristic, will usually occur, and the others gradually be dropt and become evanescent or nearly so. It is in this manner that what we call abstract ideas begin to be formed, as I think: to which for the convenience of writing and speaking we annex written and oral names, as virtue, vice, beauty, &c. which have of themselves no real existence, and are mere inventions of language, to aid our reasoning or researches.

Dr. Darwin illustrates the modification of cerebral motions in consequence of association, thus. You are desired to write the word MAN. You write it without thinking of the up-strokes and down-strokes necessary to form each separate letter, or the difficulty you experienced in this respect, when you first were taught to write; it occurs now, as one simple operation, never analysed. Yet when you consider the great variety of muscular motions of

the hand and of the eye, associated and catenated to enable you to perform this operation, there is nothing more difficult and abstruse in the most complex case of the association of ideas. The one and the other are equally matters of undeniable fact.

Where an idea is very complex, the combination may overpower the particular parts; just as in well made punch, we do not recognize the acid, the sugar, the spirit, or the lemon flavour particularly, they are all merged in the combination. So, the seven primary colours of the solar spectrum, moving connectedly and simultaneously with great rapidity, excite the sensation we call white. So in language the whole can be analysed into about 30 simple sounds, which are lost in the complexity of their almost innumerable combinations.

In complex ideas, first the visible, next the audible idea, appears to have most power in suggesting the others. Horace remarks this: *segniùs irritant animos demissa per aures, quam quæ sunt oculis subjecta fidelibus*.

Prop. 4. Language is either written or oral: it is the most familiar instance we possess of the association of ideas. The mother shews the child a peach; she repeats over and over, "this is a peach;" till the oral sound and the sensation of the peach itself, become so completely associated, that one suggests the other. It is the same in written language; wherein we first learn to associate oral sounds with written or printed letters, and that so frequently, that the suggestion of the one from the presence of the other, is instantaneous and complete. Hence, in reading a description, the words almost place the things themselves by association before the mind's eye. This is Lord Kame's *ideal presence*. Suppose I read a description of a Boa Constrictor or Anaconda, crushing a tyger. I have from pictures and descriptions of serpents and tygers a tolerably correct idea of them though I may never have seen either the one animal or the other. The ideas thus excited therefore by the verbal description, form what Lord Kame not inaptly terms *ideal presence*; an ideal representation, excited and suggested by the associations connected with the written description.

In the same way, sensations and ideas are suggested by looks, by tones, and by gestures; for looks, tones, and gestures, are the natural marks of strong emotions. Hence the superiority of dramatic representation to mere perusal; more associations are brought into play, and the ideas are more vividly excited. Looks, tones and gestures, like metaphors and other figures of speech, are more common in the early ages of society, because the poverty of a nascent language, requires their aid.

Prop. 5. When pain is associated with any sensation, it adds greatly to its vividness. It is upon this principle, that the ancient back-country practice is founded, of flogging a son, at each corner of a tract of land which he is destined to inherit, to enable him to

remember the boundaries more accurately. And this is consensual both to theory and to fact, however rude the custom may be. The same reasoning will apply to the association of pleasure. These two last propositions will explain all Lord Kame's difficulties respecting sympathetic emotions, and emotions and passions generally: thus if words, looks, tones, and gestures be (as they are) associated with emotions and passions, then are emotions and passions associated with words, looks, tones and gestures; and the one calls up the other. This needs no illustration to those who have seen the representation of a *ballet* at the French or English opera house, or who recollects the story of Cicero and the actor Roscius.

Prop. 6. In sensations and ideas, the cerebral motion communicated by the excited nerves, may be so gentle as to be nearly imperceptible; or so moderate as merely to excite slight attention; or so vivid as to be pleasurable; or so intense as to be painful. This constitutes the foundation of Lord Kame's distinction between emotions and passions.

Prop. 7. The force and vividness of ideas, depend chiefly on the following circumstances, (not excluding others of minor influence): on the original excitability of the nervous system: on the vividness of the original sensation: on the quantity of sensorial power, as Darwin calls it, or of accumulated excitability, as Brown calls it, that is accumulated in the system at the time: on the force and vividness of the associated ideas, which explain to us the use of appropriate figurative language, and the effects of tones and gestures. Sometimes in a state of general morbid febrile irritation, the accumulation of sensorial power in the brain, not consumed by muscular action, produces a vividness of sensation and perception, that greatly increases for a time the mental capacity; and when in much excess, or too long continued, produces the hallucinations of the various kinds of lunacy. That is, when usual and natural stimulation and excitation are increased so as to become morbid irritation.

Prop. 8. In considering the effect of words, Dr. Hartley's arrangement of them seems useful.

Words that have ideas only, and no definitions. *White. Sweet.*

Words that have descriptions, or definitions only, and no ideas.

Monagynia. Axiom. Radius.

Words that have descriptions, or definitions and ideas. *A Peach.*

An Isosceles Triangle.

Words that have neither. *The, To, and Of.*

It is manifest, that the greatest effect is produced by the former class, in the fine arts that constitute the objects of criticism.

It may well be doubted, if words that do not express a matter of fact cognizable by our senses, have any meaning whatever. We have no other source of knowledge but our sensations—sensations excited in the encephalon, either by objects external to us,

or by our internal wants, and visceral affections. What meaning can be ascribed to soul, angel, devil, spirit, &c.—supposed entities, not cognizable by our material senses, or any of them? Abracadabra, may be substituted for any or all of them. What evidence can we receive of a being who cannot be seen, heard, touched, or felt, and who is no object discernible by taste or smell? What can a word mean, which means nothing that we can receive any proof of—which does not exist for any of our inlets of knowledge?

Prop. 9. Mr. Hume, in his section on the association of ideas, (vol. 2,) arranges all the general and abstract sources of association under *contiguity* of time or place—*resemblance*—and *causation*. An habitual attention chiefly to the first set of associations, forms the *historian*: to the second, the *poet and dramatist*: to the third, the *statesman and reasoner*.

Prop. 10. It is probable, from what we observe, that the pleasures of sensation are more numerous, and upon the whole overbalance the pains of *sensation*. This, however, is frequently matter of accident, of health, or disease. But in *intellectual* pleasures and pains—those that depend on our *ideas*, and their combinations, and which are greatly in the power of our volition, the balance of pleasurable feeling in well educated persons, is manifestly considerable; and in the usual duration of life, it amounts to a quantity far exceeding our usual calculations. It should seem, therefore, to furnish a strong argument for study, and intellectual employments, which greatly increase in number and intensity all the ideal pleasurable associations. Moreover, the pleasures and pains dependent on the external senses, being for the most part local, have a greater tendency to destroy the body, than the *intellectual* pleasures and pains, which are not so much calculated to affect any organ in particular; and rather produce moderate exercise in the medullary substance, than any violent and destructive motion.

Prop. 11. The imperfect memory and judgment in children, and the dotage of old persons, may be explained from the imperfect, and abnormal associations that take place owing to the imperfection and deterioration of the encephalic apparatus. Hence the propensity of children to falsehood, without being conscious of the fault: and of old age, to forgetfulness and repetition.

Prop. 12. The imperfect, irregular, and incoherent intellect of idiots, lunatics, and maniacs, is manifestly dependent on the irregular associations that take place in the encephalic apparatus, owing to the irritated and morbid state of that portion of the nervous system. Thus, also, may be explained the morbid associations, from a disordered state of the stomach and intestines, however originating; for the morbid irritations of the viscera are transmitted by innervation to the cerebral centre, and produce morbid excitement (irritation) in that viscus.

Of Muscular Motion. Prop. 13. The motions of an animal body, are either instinctive, (that is, automatic) or voluntary, or associated. In the first case they are not attended by any sensation: as the motion of the heart and arteries, the motion of the lungs and diaphragm, the peristaltic motion of the bowels, &c.

The voluntary motions depend on that state of the brain, which we call volition. It is necessary, therefore, to examine in what volition consists; and what is that affection of the brain that accompanies or constitutes volition. I say, accompanies or constitutes, because the expression adopted, will depend on the theory adopted to account for the phenomena of perception. A psychologist would say accompanies: I prefer the latter form of expression.

Of Desire and Volition. Prop. 14. A child who has tasted a peach, so as to know what it is, sees a peach on a table out of his reach; what takes place? First, he has a sensation of the visible form of the peach, by the rays of light that passing into his eye, strike on the retinous expansion of the optic nerve; the motion there excited, is propagated along the optic nerve to its other extremity in the brain, and there it is perceived, forming the visible sensation of the peach. But as the child has tasted peaches, the visible sensation excites by association the idea of the taste of the peach, and this is accompanied by a desire to obtain and to eat the peach which he sees before him. This state of the brain, which, when felt, we call *desire*, is as real, and as really existent in that organ, as the visible sensation, or the associated idea of the taste of the peach; equally and concomitantly felt. It always accompanies and forms part of the sensation of hunger. That desire, when it excites an effort to reach the peach, (cerebral innervation) is *volition*, and the consequent motion is voluntary. All these states of the brain, are felt or perceived equally as existing together, and arising from the same cause; but being perceptibly distinguishable from each other, we give different names to them. If the child have eaten as many peaches before hand as he could eat, the state of the brain called desire will not be excited; the stomach will not innervate upon the brain, or call for its aid, and volition and voluntary motion will not accompany it. This shews, that it is a mere corporeal feeling, dependent on the state of the bodily organs. Is not hunger always so? and is not desire and volition absent or present in such a case, according as hunger is absent or present? Do we make an exertion to take food, if our appetite be already satisfied?

Again: my father desired me to meet him at home at a certain hour: as the hour approaches, the ideas of my promise, of my father, of home, are excited by association; I feel the desire to obey him, and I get up to meet him according to the appointment. Here, desire, volition, and voluntary motion, are associated with the recollected ideas of past sensations. All these feelings are

simultaneous, or nearly so; they are connected; they are felt or perceived in the same manner, and referred (if referred at all) to the same source, the same organ, the same place of feeling. The voluntary motion would not have taken place, if the desire had not existed: the desire is one of the circumstances attendant on, and belonging to, the sensation of the peach, or the idea of my father, and the promise made to him.

Dr. Darwin observes, (Sect. XI. 2 2,) that all our emotions and passions have their origin in sensation and volition. Pride, hope, joy, are the names of particular pleasurable sensations; shame, despair, sorrow, of painful ones. Love, ambition, avarice, are the names of particular desires: Hatred, disgust, fear, anxiety, of particular aversions. The passion of anger includes the pain from a recent injury, and the hatred to the adversary who occasioned it. Compassion is the pain we feel at the sight of misery, with the desire of relieving it.

All these, in whatever viscus they originate, are ultimately reducible to motions in the cerebral organs, there felt and perceived, and which arise from various complications of sensations and ideas into which the emotion and passion can be analysed. Take Love, for instance. A young man is frequently in company with a young woman, whose manners, looks, and tones, affect him with pleasurable sensations, and sensations of respect for her character and conduct; to these are joined the belief, or the strong hope, that he himself stands in a similar situation with respect to her sentiments toward him. All these are sensations and ideas, affording no difficulty in the analysis. They are clearly of the same nature as all other sensations and ideas, that being associated together by simultaneous or successive occurrence, modify the affection of the brain where perception takes place, just like any other complex set of associations. When to these are joined the natural sensation of sexual desire, founded on the internal state of our corporeal system, the whole sensation thus complex is called love, which is nothing more than strong feelings of friendship toward a person of another sex, accompanied by sexual desire. Nor is there any thing more difficult in the analysis of this complex sensation or idea, (for it is the one or the other, depending upon the presence or absence of the object,) than in the complex sensation of the book now before me; which is made up of the size, the form of the type, the proportion of margin, the color of the paper, the marbling or gilding of the leaves, the kind of binding, the gilt ornaments of the binding, and the peculiarity of the lettering; all of which are also at this moment associated with the paragraph I am now writing.

Moreover, in the complex sensation called love, is it not clear that the want, paralysis, or organic lesion of corporeal organs may prevent its occurrence? Can it not be rendered more vivid by sexual abstinence, or even by aphrodisiacs, as well as by the asso-

ciations of amatory description? And when the mere animal sensation is thus rendered more vivid, is not the associated intellectual part of this passion rendered more vivid also?

Desire and volition, therefore, are not merely similar to, but actually are sensations and ideas. States of the brain felt or perceived, exciting to the muscular action called for by the existing want. Aversion is only another form of desire, it is the desire to avoid. Desire simply, is the desire to obtain. In a *sensation*, the commencement is at the extremity of the nerve farthest from the brain, and it terminates in the brain. In a *volition* the commencement is in the brain, and it terminates in the muscular organ of voluntary motion.

I consider, and I state all this, as well known, incontrovertible fact—such as no physiologist will scruple to admit at once; and quite independent of any hypothesis relating to the cause, the seat, or the source of perception; whether it be a cerebral function arising from our system of animal organization, as some think, or belong to a separate being, (the soul) as others think.

Prop. 15. Hence, we see in what way automatic and voluntary motions, may be associated with sensations, ideas, desires, and volitions. It may be of use to dwell a little more on this part of the subject. First in a state of health.

They may be associated with *sensations*, as when we cut our meat, pour out our wine, move from one room to another; when a lady sings and plays at the same time; when we dance to the sound of music keeping time, &c. With *ideas*, as when a lady plays on the piano forte a tune she remembers only; when we go to a book-sellers for a book we stand in need of; when we ring the bell for a servant, &c. &c. The cases are so numerous and of such constant occurrence, that it is needless to enumerate them. With *desires* and *volitions*, as in the way described in proposition 12. These are in fact the preceding causes of all voluntary motions. So in a state of disease, when I turn to get rid of pain, it is a motion associated with (sensations); when I ask, if my physician be come? with (ideas); when I call for drink, if a thirst, with (desires.)

Many, perhaps most of our voluntary motions, were at first automatic. A child shuts his hand, or moves his foot, from the mere effect of muscular irritability, when touched. The motion of grasping with intention, or of walking, or running, or dancing, or climbing, are all learnt by degrees, and are voluntary.

Automatic motions, are either aboriginal and performed unconsciously, as the motion of the heart and arteries; or, they are generated from the incessant repetition of voluntary motion. A child totters and staggers, and exerts a voluntary effort at every step he takes while learning to walk—so does a young man or woman in learning the step of dancing—so in associating the notes of a piano forte, with the notes of a music book. By and by, frequent repetition enables them to perform these motions uncon-

sciously, mechanically, and without effort; and thus they become automatic in their character. The same observations apply to reading and writing, to talking, and in fact to all our voluntary motions.* Automatic (involuntary) motions, are also generated by a diseased state of the nervous system, as in the tremulence of palsy, and the agitations of St. Vitus's dance. Such also is the shaking fit of a common ague, which assumes periodicity, which must be broken to effect a cure. Such are the convulsions of epilepsy, the cramp in the leg, tears of pain, of pity, of anger, of laughter; the contortion of pain or of revenge; and many others noticed among catenated motions of disease, by Dr. Darwin. But the most striking cases of the association of motions with ideas, occur in the derangement of lunacy and mania; in which disorders, no enlightened practice can be pursued without a skilful application of the theory of the mutual associations of sensations and ideas, with muscular motions, healthy or disordered. Dr.

* Hence we may account for the neglect of grown persons of the studies they were compelled to undertake when young. Thus, when a young lady is made to learn music, and attains skill enough to play over a common concerto after practicing half a dozen times; by that time she probably marries, and is no longer forced to perform, what requires an effort in the performance. She leaves off her music, and her piano forte becomes a mere piece of furniture in the drawing room. But if she has been compelled to practice until all the voluntary motions for a long time attended with effort, become automatic, the inducements to practice remain, and the associations of exertion and painful effort are superceded: in this case she practices through life. Until this state of automatic motion be attained, all previous labor is thrown away.

In like manner, a boy is sent to learn Latin and Greek, and he continues at it during all the period of painful effort in acquiring it, and he quits school, or college, before the period of exertion has past. Then he joyfully throws away his Homer, Virgil and Horace, determined to plague himself with them no more. All his previous acquirement—all the time employed in it—all the painful effort in getting his tasks, are thrown away; and in three years his classical literature has evaporated forever. Had he continued till words, phrases, and idioms, were so associated with their exact meaning, that the recurrence of the one from the other should happen without effort and without pain, his classical knowledge would be a daily amusement of inestimable value; it would form his taste in every subsequent study, and intermingle with abundant benefit in every future literary or scientific pursuit. It was thus that Leibnitz & Newton, Hooke & Ray, Linnæus & Bergman, Hoffman & Haller, and North, Burke, Fox, and Pitt, were formed. Accurate and profound classical knowledge was the foundation of the edifice, literary, scientific, or political. This will never happen with us, till the upper classes of college youths shall be compelled to translate into correct Latin, a page from some English author, and compose at least ten Latin verses, twice or thrice a week. To have our youth well educated among those who can afford to be so, the entrance to college should not be permitted before 17, and the scholastic (classical and mathematical) preliminary requisites should be high, and rigidly exacted.

Darwin, whose principles are borrowed originally from Dr. Hartley, and the elements of medicine of Dr. Brown, has certainly shewn the very extensive application of the whole doctrine of association to an enlightened theory of medicine; and has presented numerous facts of direct application to the principles here stated. His *Zoonomia* is the work of a very powerful mind.

From all these facts, then, it appears that by the common laws of our animal structure, long observed and well ascertained by professional observers.

Sensations, may be, and in instances innumerable actually are associated with other sensations, with ideas, with volitions, and with muscular motions voluntary, secondarily automatic, and instinctive or primarily automatic; not only in health but also in disease. Instances are, a tune played accompanying a tune sung—a tune played from memory—when I walk out to visit a friend. This last is an instance of voluntary motion also—the first is a secondarily automatic motion, when the fingers move unconsciously over the keys of a harpsichord—other instances may be imagined accompanying the peristaltic motion of the bowels.

Cases of automatic and involuntary motions accompanying sensations and ideas are also—the paleness and clammy sweat of fear, the flush of anger, the agitated motions of great joy, the exclamations of grief, &c. &c.

Ideas, desires and volitions may be also mutually associated, and with all the varieties of muscular motions: of which the above cases, and others similar easily imagined, furnish examples. Also with words, looks, tones and gestures.

Motions originally automatic and involuntary, as the motions of a child's limb unconsciously moved by muscular irritability excited by any stimulus, may become voluntary, when it is necessary that they should be associated with desires and volitions. So by an association with a particular time of the day, we may convert an automatic peristaltic motion, into a voluntary one, as Mr. Locke, and physicians generally recommend to be done.

Motions originally voluntary, may by very frequent repetition become secondarily automatic; as is the case in writing, reading, playing on an instrument, &c. &c.

Motions of health may be associated with motions of disease and vice versa; the treatise of Dr. Darwin, and of the physicians who give an account of nervous and sympathetic actions, contain abundant instances. Mania, melancholia, lunacy and ideocy—the delirium of fevers, &c. include strong examples.

All *sensations*, are motions propagated from the sentient extremity of a nerve along the nerve, to the brain, and there felt or perceived.

All *Ideas* are similar motions, arising in the brain either from association, or from some accidental state of that organ, or of the nervous system generally.

All *volitions* exist as states of the brain, associated with, and forming part of the sensations and ideas to which they respectively belong; from whence the motion is propagated to the muscle of voluntary action, by cerebral innervation.

We know not positively, whether the instrument of motion, or that substance in which the motion takes place, be the particles of the nerve—an unknown secreted nervous fluid—or a secreted galvanic fluid. It is rendered probable, that the galvanic fluid, will to a certain degree supply the place of nervous communication. But no theory can yet be framed on this subject.

There is no reason to suppose, that emotions, passions, desires, aversions, volitions, are any other than motions that take place in the organ of the brain, and are there felt or perceived: inasmuch as they can all be analysed into sensations and ideas, and their concomitant perceptions, which are undoubtedly cerebral motions and nothing more.

It is not known, whether perception, or feeling, be a property of organization in those animals that have a nervous system—or whether it belong essentially to life, or that property of organized beings which enables them to feed, to digest, to grow, to assimilate and renew, and to perform the motions usually denominated living functions—whether that life owe its existence to the organization with which it is connected, or to the gift originally of our Creator; in which case, organization will be a property or result of life previously imparted, and not life a property or result of organization—or whether perception or feeling be not ascribable to some distinct immaterial being connected with the body at the command of the Creator; the prevailing opinion, to which metaphysical philosophers seem to be driven, from the difficulty of conceiving, how any mere modification of unthinking matter, can become thinking matter. A difficulty which undoubtedly lessens as our knowledge increases. But the existence of a fact may and very often indeed is indubitable, although we cannot explain how or why it is so. Such are the general outlines of the doctrine of association.

The following are examples of the way in which some of the principal mental phenomena can be explained by it.

Of memory. Prop. 16. Memory is the term applied to the recurrence of ideas representing past sensations. These ideas recur in consequence of being in some manner associated with ideas already present to us; unless in those accidental cases of sleep or disease, when the internal state of the body, gives rise to automatic involuntary motions and affections in the brain similar to ideas that have already existed there. But these exceptions are few, and do not disturb the general remark: so that I consider the doctrine laid down by Lord Kame that ideas always occur in a train, as true. The idea of my father suggests the idea of my mother, &c. &c. The idea of a peach, suggests the last peach I

eat, the place, the circumstances, &c. It is clear from the commonest observation of matter of fact, that this is the train in which ideas recur: this recurrence is *memory*. What other cause *can* be assigned for the presence of a new idea, but such as is here suggested? It cannot arise without a cause. Let the reader try and assign any other. That which is clearly and undeniably true in a very great number of instances constituting all that we are acquainted with, must be taken by us as true in all instances; according to the common and known rule of philosophizing. Memory then is no more than a case under the general law of association of ideas.

Recollection: this is the term employed when there is an effort of volition to call up ideas by means of association. When the desire of recollecting is excited, all the motions that take place in the brain are stronger and more vivid, and more associations are thus excited than would otherwise take place. Still, it is by means of associations only with the ideas already present, that others are called up. Let any one make the experiment, and ascertain for himself whether it be in his power to recall any idea but by means of some other idea associated with it: he will find on trial that he has no other means. Recollection therefore, is also a case of association. It is greatly impaired by the effect of stimulating liquors taken into the stomach, on the brain. The cases of *delirium tremens*, and *mania à potu*, are decisive proofs, not merely of the cerebral motions being disturbed and deranged by the internal state of the body, but also of new motions generated, that put on the forms belonging to anger, terror, apparitions of strange persons and figures, that have no existence but in the disordered motions induced by the stimulus of liquor on the nerves of the stomach, communicating morbid action to the brain. The same passions, emotions, and unreal images are frequently attendant on mania, on hypochondria, and other forms of cerebral derangement, owing to the general affection of the nervous system induced by a greater or less degree of irritation and consequent morbid action of the viscera, or some of them; (see a very curious illustration in Sir W. Scott's *Demonology*, p 28, of insanity recalled by association.) Such also is the case of those hallucinations that attend the delirium of fever. No physician whatever, doubts, but that he has it in his power to change and alter the state of the body, by food and by medicine, and that he can alter the existing trains of ideas (i. e. cerebral motions) induce new ones, excite emotions, passions, desires and volitions, that would not exist but in consequence of his operations. Let any physician, reflect for a moment on the stimulating powers of opium, hyocyamus, datura, lytta, alcohol, &c. and he will acknowledge that all the derangements of mania are artificially in his power to produce, while the depleting, sedative, and contra-stimulent medicines equally operate when the same disorders from whatever cause, happen to

arise. Intellectual phenomena, feelings painful and pleasurable, desires, volitions, memory, thought, hallucinations, &c. thus within the power of medicine and regimen, what else are they than corporeal phenomena?

Of Judgment. Prop. 17. This takes place when we compare two ideas or two sets of ideas together for the purpose of ascertaining their agreement or disagreement. Thus, when I determine that Alexander is the same person who was the conqueror of Darius, or that prohibitory and protecting duties are inexpedient, I pass a judgment on the comparison of these sets of ideas. Their resemblance or disagreement is equally an object of perception with the ideas themselves; it is a cerebral affection like them. When I see an apple and a musket ball on the table, is not their dissimilarity as plain, as visible, as sensible, as the things themselves? Judgment therefore is like sensations and ideas, an excitement, a stimulation, a motion in the brain perceived. For the differences of those motions, are equally real and equally cerebral affections as the motions themselves. When I feel or perceive that difference, what is it but an affection of the brain that I feel or perceive? What other meaning do you give to difference? or to sameness?

Of Thought. Prop. 18. To think or to reflect, is to exercise recollection and judgment. No other elements are contained in what we call thinking. What recollection and judgment are, such is thought therefore.

Of the Will. Prop. 19. The will is that state of the brain, attendant upon vivid sensations or ideas, concomitant with desires and aversions, and that excites us to action; it is as real as the sensations or ideas, and as really corporeal. For instance, that sensation called hunger does not arise, when the stomach is completely satisfied, and therefore it depends on the state of the bodily organs. I see before me on the table, a piece of roast beef, a knife, fork and plate: if my stomach needs food, the sensation accompanying these visible images, will be associated with hunger: if the stomach be satisfied it will not. If it be accompanied by hunger, the desire, wish, will or volition to eat, and the consequent motions to carry that volition into effect, will take place not otherwise. The desire, therefore, is a state of the brain dependant on the excited state of the bodily organs that act by transmitted excitement, that is, by innervation, on the encephalon. It is a peculiar state of the brain associated with a peculiar state of the stomach. All desires and aversions, wishes and volitions when analysed will in like manner be found nothing more than modifications of cerebral motion arising from the circumstances that excited the motions themselves.

Of the Moral Sense. Conscience. Prop. 20. This has long been considered as an innate faculty of the mind or soul, given to us for our moral guidance, and by whose dictates, our conduct is to be

governed. *When*, this was implanted—*how* its distates are made known to us—or *why* it is not uniform with all men in all places—the proposers of this notion, do not explain.

Let us see how far it is, or is not a corporeal affection.

What is morality? That course of conduct in individuals, which upon the whole is best calculated to promote the happiness of society. It relates in all its parts to society; for there is no rule of moral conduct applicable to an individual perfectly insulated—entirely unconnected with all other living beings.

Children have no idea of right or wrong, or truth or falsehood, or of the obligation men are under to pursue the one and avoid the other, till they are taught it with great pains by their parents first; then by their tutors, then gradually from their companions, from the laws of the community, from conversation of respectable people, and from books. *These*, are the sources of the moral sense. Every body who is conversant with very young children, knows that they have no notion of the difference between truth and falsehood till they are taught it;* that they beat their attendants and the animals they play with, till they are with great labor taught that it is wrong to do so, and punished for doing it. In like manner, they are taught with no small pains, all the habits of cleanliness necessary to their comfort and this takes the incessant assiduity of some years: nor would they make any progress in this knowledge, if it were not for occasional interposition of praise when they do as they are bid, and still more efficaciously to associate pain with the actions they are taught to avoid. Is it in this manner the moral sense is formed originally; and during childhood it extends only to our domestic relations. The young folks are then sent to school, where the same pains are taken to teach

* Sir Walter Scott in his history of Demonology makes the following remarks p. 185. The melancholy truth, that “the human heart is deceitful above all things, and desperately wicked,” is by nothing proved so strongly as by the imperfect sense displayed by children of the sanctity of moral truth. Both the gentlemen, and the mass of the people, as they advance in years, learn to despise and avoid falsehood; the former out of pride, and from a remaining feeling derived from the days of chivalry that the character of a liar is a deadly stain on their honour; the other, from some general reflection upon the necessity of preserving a character for integrity in the course of life, and a sense of the truth of the common adage, that “honesty is the best policy.” But these are acquired habits of thinking. The child has no natural love of truth, as is experienced by all who have the least acquaintance with early youth. If they are charged with a fault, while they can hardly speak, the first words they stammer forth, are a falsehood to excuse it. Nor is this all; the temptation of attracting attention, the pleasure of enjoying importance, the desire to escape from an unpleasing task, or accomplish a holiday, will at any time overcome the sentiment of truth, so weak is it within them.

If there be any innate moral sense—any naturally implanted and constitutional feeling of the obligation of morality independent of all instruc-

them the duty of learning their lessons, of paying obedience to their teachers, of abstaining from lying, cheating and quarrelling, and they learn much also by their intercourse with other children at school, and feel on all hands that punishment usually follows what they are taught to consider as misconduct. The same course is pursued in greater schools, and at college, and an incessant and severe course of discipline is found absolutely necessary to confirm in them while young, those habits which will render them useful members of society when grown up; and eradicate the propensities which if indulged would render them objects of dislike and distrust to their fellow citizens. But even on leaving the seminaries of education, moral habits thus incessantly inculcated, are seldom so steadily formed, as to overcome the violence of youthful passions; and many years of intercourse with the better part of society, are necessary, before a man's moral character is so fixed as to be implicitly relied on. Nay, even in civilized society, the theory of morality is so far vague, that in some points it is different in different countries, and the laws that regulate it, have no common standard in every civilized nation; and even in the same nation they greatly vary in every century; they are called forth and enacted by unforeseen circumstances, and as it seems to me, they are improving. Assuredly the manners and customs throughout Europe are far better now, than they were two centuries ago; and the standard of morality is higher on the scale. Why? Because experience gradually teaches us, what rules of conduct society ought for its own sake to insist on.

Morality thus accompanying in all its stages the gradual formation of ideas, and the gradual developement of knowledge by instruction, and which varies according to the existing state of knowledge in every age and every country, and every individual, cannot be the result of any innate imparted faculty perfect from the beginning. If we learn this morality from our instructors and our books, after long discipline, as we learn languages and the mathematics, why seek

tion, it will be found more pure, and unmixed in children, not yet spoiled by commerce with a selfish world.

If there be any moral precept more universally binding than another, it is the duty of abstaining from falsehood and telling truth. But how different are the facts from the theory!

Indeed the supposed moral sense, is one of the numerous ontological reveries of the Scotch school of metaphysics; whose personifications of words, have peopled the realms of imagination with beings innumerable—misty, shadowy forms invisible, inaudible, intangible, unintelligible! No wonder these men of words treat physiological metaphysics with such contempt! Dugald Stewart dismisses Hartley in a page or two; and the wise man who drew up the article metaphysics for Brewster's Edinburgh Encyclopedia, gravely assures his readers (p 93) that "Priestly is unworthy of notice as a metaphysician!" I dare say Messrs. Reid, Oswald, and Beattie, thought so too. All this is natural: *quicquid recipitur, recipitur ad modum recipientis.*

out for any other source of moral acquirement? Let us be content with the causes which are true in themselves, and which suffice to explain the phenomena. I know of nothing approaching to satisfactory proof of any innate moral sense. It is one of the dreams of ontologists and metaphysicians.

Prop. 21. Of the conversion of selfish into social and benevolent affections. All the associations of children are selfish: they are taught kindness toward others, by the incessant precepts, and the example of their parents and friends: they are praised and often rewarded for kind actions done to each other, and in all ways encouraged so to act toward every body, and they are reprimanded when they act otherwise. The kind feelings gradually associated with their parents, relations and friends, incite them to do what they think will please, and produce approbation. From thence forward, in all situations in life, they find that it is of advantage to themselves, and pleasurable also, to contribute to the happiness of others: that this course and conduct begets kindness and respect towards themselves, and that the language of kind feelings, is the language of civilized society. This is still more encouraged when they marry and have children, who are continual objects for the exercise of the benevolent affections. In proportion, also, as they take a common interest in the welfare of the community to which they belong, they are tempted to sacrifice their own interest to the interest of society: in this way patriotism takes its rise and its growth; which, though frequently simulated, is also frequently genuine. By these means a habit is generated by many people, of doing good to their fellow creatures, as a matter of pleasure to themselves, in all cases where the dictates of common prudence do not absolutely forbid it. This habit, by associating pleasurable ideas with kind offices, contributes greatly to the happiness of men in cultivated society; and even the outward forms, and the tones of kindness, generally assumed among the upper ranks of society, having pleasurable feelings associated with them, add much to the mutual satisfaction that good company feel toward each other, even when they know that these forms and tones of perfect civility, mean little, as to real generosity, or even good will.

Prop. 22. Of the fine arts and criticism. From what has been said above, and seeing that all our intellectual pleasures and pains, that is, the pleasures and pains connected with our sensations, ideas, emotions, passions and desires, depend on associations, it should seem that the verbal or written representations intended to excite them, should follow the usually observed course of association that takes place in the circumstances themselves; and that their correctness in this respect will form the natural feature of the description, and the aberration will be a fault. Hence, also, those figures, epithets, and mental pictures, displayed by the art of the composer, should consist of those associated circumstances that most vividly excite the required ideas and feelings.

This seems to be the general rule, but applicable to all the detail we find in the writers on criticism.

Prop. 23. Of the Intellectual faculties of brute animals. They differ from the human species, in the acuteness of the facial angle : in the comparative smallness of the brain : in having few or no articulate sounds : in being incapable from the structure of their organs, to invent or use the mechanism of language : in possessing fewer means of acquiring ideas by eye-sight, and by that portion of feeling that depends on the skin : in being incapable of writing : in being incapable of inventing or using tools and instruments of art : in being incapable of improvement in knowledge by means of the knowledge of a former generation, which they have no means of accumulating or transmitting : by the continued attention necessary to supply their animal wants, which many men are free from. Hence their intellectual ideas, pleasures and pains are few indeed compared to those of man ; while their automatic or instinctive motions and sensations, may be on this account more perfect.

These circumstances, consisting of, or dependent upon, the difference of organization, are quite sufficient, as it seems to me, to account for their intellectual inferiority. Let us examine what mental phenomena they do in fact exhibit.—And first, they have the same system of animal parts, that men have ; and they have a similar nervous apparatus. Experiments on vertebral animals, shew that the cutting, tying, or otherwise compressing the nerves, has the same effect on them that it has on the human species ; and therefore we are justified in referring their sensations and ideas to the same general organic mechanism. The very many cases cited and referred to in Bingley's *Animal Biography*, and in the 2nd vol. of Bronson's *Select Views*, shew that brute animals may be taught as we teach children : they are operated on by the same associations, and the same motives of pleasure and of pain. If we wish to deter a young child, or a young dog, from making a dirt improperly, do we not in both cases associate pain with the circumstance, as well as the threats of language, tone, and gesture, that we think them likely to understand ? How is a boy taught his lesson, or a setting dog, or a setting pig, like Mr. Toomer's, prevented from running in on a covey of partridges, but by the associations of punishment ? and of encouragement by praise and reward when they do well ? Is there any other mode of instructing dancing dogs, dancing bears, or learned pigs ? They have, therefore, sensations, ideas, and associations of these with voluntary motions. They have volition therefore. Do they reason ? Do they form a judgment from circumstances, and act accordingly ? Let us enquire. Is it not a known fact of dogs and cats, that they will steal victuals when they suppose themselves unobserved ? Does a cat jump upon the table to steal meat, when the table is surrounded with company ? And will she not do so when

no one is in the room? Who has not seen this? When a bird intices a snake away from the nest of her young, is not this reasoning? When a dog, having lost his master, goes in succession to his usual places of resort to find him, (as has happened fifty times to me) what intellectual process is this if it be not reasoning? Do not the young dogs of a pack rely on the experience of the old ones? When wolves hunt deer, by arranging themselves so as effectually to prevent the escape of their prey, by driving them to a river previously guarded by other wolves, which hunters well know to be a practice among them—when crows or geese appoint a watchman for the flock, to give notice of the approach of strangers, what is this but reasoning? So when a dog, unable to eat all the food in his possession, buries it as I have often seen, is not this reasoning? “A dog is frequently lost and finds his way home. His *perception* is exerted on every object around him: his *memory or recollection* is shewn by his perceiving that he is not at home and endeavoring to go there: his *judgment, or ratiocination*, by discovering his way home, and chusing this street rather than that: his *volition*, by going home rather than not going home. These, and similar facts, are so strong, that some writers, as Locke, have been reduced to place the differentia of a man and a brute, in this, that the former is, and the latter is not capable of framing general or *abstract* ideas.”

“Dogs generally come when they are called, whoever calls them: at least they attend to the voice and seem to consider whether they should come or not. I presume it will not be denied that when a dog is called, he attributes the voice if it be not his owner’s voice, to some other man. Now suppose a stranger calls a dog by his name in a voice different from his master’s voice, and the dog runs toward the place whence the sound proceeds, will any one assert the dog has not the idea of some *man* in this case, who calls him, when by the very terms of the supposition he cannot have an idea of any *particular* man, since the voice is a stranger’s? If so, then are dogs capable of framing general or *abstract* ideas.” (Cooper’s tracts.) So, if a noise at the door, accompanied by the voices of strange persons should be heard by a dog kept to guard the house, and he barks, has he particular or *abstract* ideas, when he neither knows or sees the persons?

These facts, establish with me the positions, that brutes have the power of exhibiting mental phenomena of like kind with those of the human species but inferior in degree, and far fewer in number and variety—that they are therefore nearly devoid of intellectual pleasures and pains, of which a dog appears to enjoy more than any other animal—that their automatic motions, and some organs of sense, are sometimes in higher perfection than in man—that they have not the means of accumulating, or communicating acquired knowledge, or of improving their intellectual faculties unless in very low degrees—and that all this is dependant, on the

very great and manifest inferiority of their corporeal organization, which does not furnish the apparatus for the purpose.

Hence it has been argued with some plausibility, that as there is no evidence whatever for the existence of a human soul but what is furnished by the human body—as all the faculties of the soul as they have been called, are resolveable into states of the body, phenomena of the nervous system—as brute animals exhibit phenomena exactly of the same kind, though not equally curious or complicated—there is as much reason for attributing an inferior immaterial immortal soul to brutes as there is to man; for its existence is deduced from the same class of phenomena in both cases. But where shall we draw the line? Are we prepared to admit the soul of a mosquito or an oyster?

It is quite manifest, however, as I apprehend, that no medical education can be complete that does not embrace an accurate view of the association of ideas; so as to point out the path along which we may trace if diligently pursued, those associations of cerebral and muscular motions that depend on the state of health and disease, particularly the associations connected with the morbid states of internal viscera; whose actions when healthy are instinctive, automatic, unperceived, and have no perceptible effect on cerebral motions. As in the various forms of lunacy. So as to point out also the varieties of association, and the modifications of our modes of thinking and acting owing to the various causes arising from temperament and from sex. Hysteria will furnish cases.

So as to point out also the various catenations of motions, voluntary and automatic that are modified by health or disease, as noticed by Darwin; pursuing his train of reasoning on this subject. This seems to me to lead to the source of periodicity in disease. On all these subjects, the 1st vol. of Hartley on Men, Darwin's Zoonomia, and the admirable work of Dr. Cabanis, *Rapport de Physique avec le moral de l'homme*, should be studied. Dr. Rush's lectures contain much interesting fact, manifestly accumulated with this view, and managed very guardedly, but with great force and talent, as well as with great popular interest. The medical school of Philadelphia has indeed profound reason to regret the loss of this truly great man. It is well known to others as it is to me, that the hypothesis of a soul to account for mental phenomena, was rejected by Dr. Rush.

It is quite manifest, that no metaphysical enquiries into the phenomena termed mental, amount to any thing more than the wordy war of disputants ignorant of facts, unless those enquiries be first pursued by ascertaining how much can be explained by the known phenomena and acknowledged properties of our corporeal system before we introduce an hypothesis for the purpose. I have no hesitation in saying, that no good physiologist, as every physician is or ought to be, can peruse a metaphysical treatise of

the clerical school of antient or modern times from St. Austin to Dr. Copplestone, without disgust. I do not deny great talent or great acuteness to such men, as Hobbes, Bramhall, Clarke, Jackson, Collins, Edwards, Tucker, Copplestone, Brown, &c. but they do not begin from the foundation, they do not state distinctly what are the corporeal phenomena that bear upon the subject—how far they will go in the explanation of the facts and where they stop. They are not aware that the functions of an organized part, are the essential properties of that organ; arising from, and depending on, and essentially belonging to it. They are manifestly labouring under utter ignorance of the most material facts that bear upon the subject: and therefore when they are right, they are right by chance. The knowledge of the present day will not rest satisfied with reiterated and obstinate assertion resting upon half information; nor will logomachy pass current for physiology.

It is evident from the preceeding slight sketch of the *Association of Ideas*, which I hope will incite to, and not supersede the perusal of Hartley's work, and Darwin,

That, it consists of an enumeration of facts, occurring among the tissues of which our bodies are composed, depending upon the laws of animal organization.

That, we know not how or in what manner associations of cerebral and muscular motions arise, any more than we know how digestion assimilation, secretion, &c. are performed. The gradual accumulation and comparison of observed phenomena by our posterity may possibly give a further insight into these secret operations of nature, or they may not. The facts however remain facts, and will so remain, whether we or our posterity can explain them or not.

That, the *Association of Ideas*, explains satisfactorily in what way we acquire knowledge, by the association of looks, tones, gestures, words, and phrases with natural objects of all kinds, with intellectual functions of the nervous system, and with corporeal emotions, passions and other phenomena. Also,

In what way properties common to many objects give origin to abstract terms, which are then used to express the bundle of real properties wrapt up in their meaning; and are used to abridge reasoning; as the letters of a mathematical proposition, or the positive and negative signs in Algebra.

That, whereas in Algebra and the mathematics, the precise value of the signs used are always fixed and strictly adhered to, so that no defect in the chain of reasoning can arise from an aberration, the abstract terms that confuse the modern logomachies in ideology, ontology, psychology and the other branches of metaphysics, have not been so fixed, and are not so strictly employed; so that one writer means one thing by a phrase used, as idea for instance, another writer another; nor have any of the metaphysicians so traced to its origin and strictly defined and employed the

abstract terms he makes use of, as to avoid this universal source of inaccuracy and confusion. This arises from their personifying abstract ideas, which are words only, not things—from their using expressions including anatomical and physiological facts, without being sufficiently acquainted with anatomy and physiology. As an instance of the opposite and praise-worthy practice, I refer to the preceeding work of Broussais *Sur l'Irritation et la Folie*.

That, the *doctrine of the association of ideas* explains fully, plainly, and satisfactorily, the real origin and formation of those ideas and habits, called the moral sense, conscience, natural sense of right and wrong, &c.; and shews, conclusively, that these are gradually formed during the progress of our education, our studies, and our intercourse with the world; and are not, as the Scotch school, after Pere Buffier, would teach us, instinctive in the human race. For if so, this instinct would be alike every where. Hence we have a clue to the real meaning, of the terms, moral obligation, right, wrong, virtue, vice, duty, &c. by tracing distinctly the class of actions to which these words have been applied and associated, viz. those actions and rules of conduct which it is the interest of men in society to enforce toward each other, and by the operation of laws, and the force of public opinion, to make each individual of the community find his own permanent interest in conforming to them. That in all matters of taste, of painting, sculpture, architecture, literary composition, oratory, poetry, criticism, the foundation rule is, to discover what are the natural and usual associations calculated to produce the effect intended. For if the composer varies from these, he offends the rule of good taste in proportion. I have already cited that very amusing specimen of correct and natural taste in the use of the association of ideas, by Shakspeare, in *Dame Quickly's* enumeration to Dr. John Falstaff, in the 2d part of *Henry 4th*, act 2d, scene 1st.

Upon this doctrine can be explained, the natural connection of looks, tones, gestures in the drama and in oratory, particularly in the mime or ballet. To this may be referred all sound criticism, as to trope, metaphor, allegory, simile, and all kind of embellishment in literature and the arts. The whole art of landscape gardening, depends on the principles furnished by this department of physiology; teaching us the necessity of harmony in all our groupings and fictions, and warning us from all the incongruous and inconsistent imagery into which poets and painters are so apt to fall, of mixing under the same association, things possible and impossible, natural and artificial, sacred and profane, and the other innumerable offences against natural propriety, and historical costume, which I have no room to notice.

I might proceed now to treat separately some other results of a due consideration of the phenomena in question: as of liberty and necessity. But this question will have no difficulty to those who have read Broussais, and my note on the subject in the tract on

Materialism. Those who desire a confutation of what is ignorantly called the "freedom of the will," may be referred to 1 Hartley on Man, p. 500 : to Anthony Collins' tract on Liberty and Necessity : to the small discourse of Hobbes on the same subject, in his Tripos : to Priestly, on Liberty and Necessity ; and the writings of Jonathan Edwards, of New England. But to a physiologist, all this reading will be superfluous.

How, by what organic mechanism this association and catenation of sensations, ideas, volitions, and cerebral motions with each other takes place—what is the immediate rationale of the process—who can tell ? I do not pretend to afford any explanation of this, or indeed of any other of the nervous phenomena. Still the facts will be facts, whether they be explained or not. The combinations of matter and motion that we can put together, will no more explain the life of a plant than the volition of a man ; but in neither the one case or the other do we actually see any thing else, nor have we the slightest evidence that any thing else is concerned. To say that it is impossible that matter and motion should produce the timid shrinking of a sensitive plant, or the retreat of a child from a disagreeable object, is, to say the least, a very presumptuous limitation of the powers of nature within the limits prescribed by our own ignorance.

FINIS.